

ART. 33.—*Material for a Monograph on the Diptera Fauna of New Zealand: Part III—Family Empididae.**

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[Read before the Wellington Philosophical Society, 25th October, 1921; received by Editor, 31st December, 1921; issued separately, 12th May, 1923.]

ALTHOUGH the present work deals with twenty-three species of Empididae, considerably more exist in New Zealand; many more have already come into my possession, but too late, unfortunately, to be included herein. For several of these I am indebted to Mr. J. W. Campbell, of Christchurch; my thanks are due also to Mr. G. E. Archey for the loan (through Mr. Speight, the Curator) of Hutton's types from the Canterbury Museum.

The Empididae may be characterized as follows: Head more or less spherical, but occasionally higher and narrower, or flattened from above and below. The occiput is usually convex, but sometimes concave in the middle; in some cases it encroaches considerably over the top of the head, the ocellar triangle being then situated well forward and the front shortened; there are three ocelli. The eyes, which occupy most of the head, are hairy or bare, deeply or slightly emarginate at the antennae, partially or wholly holoptic, or broadly or narrowly dichoptic on the front or face in the male or in both sexes; when holoptic the upper facets may be larger than the lower; the posterior eye-margin may be concave or convex. The front may be broad or narrow, practically absent, short or long, horizontal or more or less vertical. The antennae are closely approximated at the base and inserted about the middle head-height or a little above or below; the first two joints are short or the first somewhat lengthened; the third joint is pointed apically, but may be short and more or less oval, or elongate and clavate; it terminates in a one- or two-jointed style, which is either shorter or as long as the third joint and more or less stout, sometimes ending in a short distinct process, or is long and bristle-like. The face varies in shape according to the proximity of the eyes, and also to the position of the oral margin, which anteriorly may approach so near to the antennae as to greatly shorten the face. The proboscis is chitinous and shorter than, as long as, or longer than the head-height, while the palpi are comparatively short.

The thorax when viewed from above is more or less rectangular, but in profile varies more or less from normal to decidedly hump-backed; the prothorax is usually distinct from above, but may be more or less hidden by the dorsum, which in some cases is flat or somewhat concave immediately anterior to the scutellar suture, in this respect resembling some species of Dolichopodidae; the notopleural area may merge with the dorsum. The pleurae are usually normal; but in certain cases, where the sternopleurae are produced posteriorly and adjoin the hypopleurae, the pteropleurae are crowded upward between the meta- and sterno-pleurae.

* Part I, Stratiomyidae, in *Trans. N.Z. Inst.*, vol. 49, p. 172, 1917; Part II, Syrphidae, *l.c.*, vol. 53, p. 289, 1921.

The legs are slender and moderately long, or short and stouter, and are frequently sexually dimorphic—the commonest form being the enlargement of the protarsi; in other forms the mesotarsus (fourth joint) is enlarged, or femora, tibiae, or coxae are unusually developed. The claws and pulvilli are well developed.

In the wings (fig. 1) there is a certain amount of variation of shape and venation. The anal angle may be strongly or moderately developed or altogether wanting; vein Sc either meets the costa or evanesces toward its apex; R_4 and R_5 either branch or are fused throughout. When branching, R_4 leaves R_5 at an acute or right angle, and in some cases is recurved to meet the costa; in one genus (*Blepharoprocta*, not yet recorded in New Zealand) it joins R_{2+3} and not the costa, the recurving being an approach to this state. In some species M_1 and M_2 are wholly or partially fused after leaving cell 1st M_2 , and when completely fused may not quite reach the wing-margin. Cu_2 is either recurrent, being more or less parallel with the posterior margin when it is confluent with 1st A, or forms an acute or right angle with 1st A, which at times is more or less completely evanescent, as is sometimes also cell Cu. In many of the Empid wings there is a spurious vein, similar to that of the Syrphidae, running through cells R and R_5 ; cell 1st M_2 is rectangular, triangular, or narrowed apically, while in some genera (not yet known in New Zealand) it is completely wanting.

The abdomen is more or less robust or slender. The genitalia of the male vary considerably; in some species they are more or less concealed, in others prominent and knob-like. The most unique forms are found in the genus *Hilara*; in many of these flies there is a sheath-like appendage frequently almost as long as the body itself (fig. 2) or much shorter. A dissection of this appendage—which I refer to as the “genital appendage”—shows that it is the sheath of the penis, which is extremely long, the genitalia being attached to it on each side on the upper side at the base. This appendage is blade-like, being laterally compressed, and the penis, which is a flexible, chitinous, thread-like structure, leaves the abdomen ventrally and runs around the edge of the sheath, entering and projecting beyond the genitalia on the dorsal anterior angle of the sheath (fig. 2); the penis is retracted within the genitalia by being drawn upward from the lower edge of the sheath to the upper, as shown by the dotted line. When at rest the genitalia are enclosed (fig. 2A) beneath the dorsal plate of the third-last abdominal segment, the penultimate and ultimate being

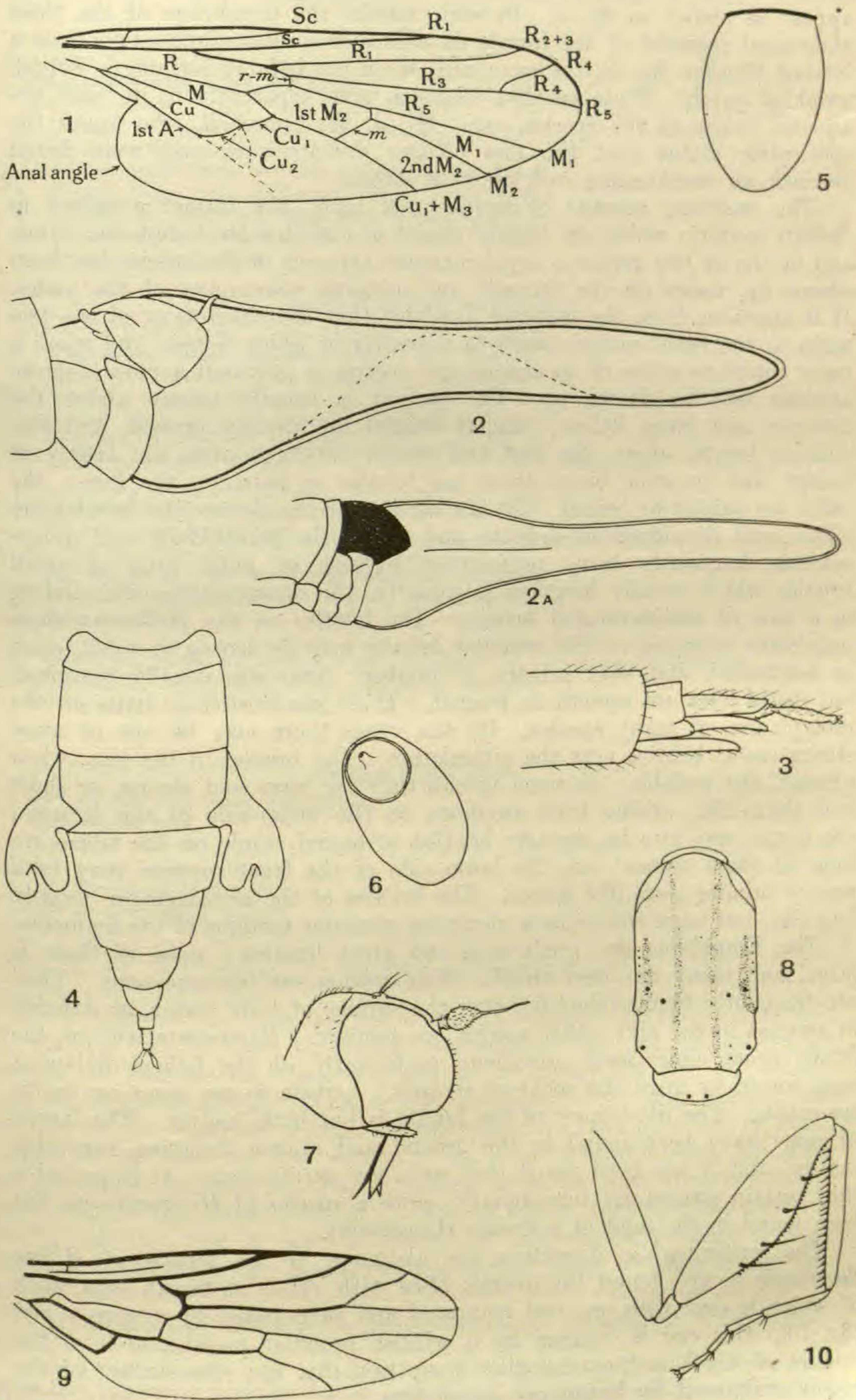
FIG. 1.—Diagram of an Empid wing, showing venation: the dotted lines represent various positions assumed by Cu_2 in relation to 1st A.

FIGS. 2-6.—*Hilara flavinceris* n. sp.

2. Genitalia of ♂, showing the sheath of the penis, or “genital appendage”: the dotted line shows position of penis when its apex is withdrawn; the heavy inner line represents the position of the penis. 2A. Genitalia of *H. dracophylli* n. sp., showing the genitalia (black) closed within the abdomen.
3. Apex of abdomen, ♀.
4. Abdomen of ♀, showing bladders inflated.
5. Egg, side view.
6. Egg seen from anterior end, showing micropilar projection.

FIGS. 7-10.—*Hemerodromia fontanalis* n. sp., ♀.

7. Head, side view.
8. Dorsum of thorax, showing chaetotaxy and colour-pattern.
9. Wing.
10. Anterior leg.



much shortened in height to receive the genitalia. The female abdomen ends in a pair of stylets, and when the apical segments are extruded they appear as shown in fig. 3. In some species the membrane of the third abdominal segment of the female on each side may be inflated to form a bilobed bladder (fig. 4), the membrane when not inflated forming a whitish wrinkled patch. These peculiar bladders have apparently to do with the aquatic habits of the species, since Mr. J. W. Campbell, who found the specimens, states that the flies (*Hilara flavinceris* n. sp.) were found beneath an overhanging rock above a stream.

The vestiture consists of bristles and hairs, the former arranged in definite systems which are beyond doubt of considerable taxonomic value, and in one or two genera a supplementary synopsis of the species has been drawn up, based on the thoracic and occipital chaetotaxy of the males. It is apparent from the material available that the chaetotaxy of the two sexes in the same species varies to a greater or lesser degree, and when a more complete series of specimens and species is procured a more definite account will be drawn up. The occiput is usually bristly above the foramen and hairy below; ocellar bristles are usually present, and also delicate frontal ones; the first and second antennal joints are bristly or haired, and in some forms there are bristles or hairs on the face; the palpi are bristly or haired. On the dorsum of the thorax the bristles are either well developed or delicate and small, the acrostichals and dorso-centrals frequently being represented by one or more rows of small bristles which usually lengthen posteriorly, the dorso-centrals often ending in a pair of well-developed bristles. The bristles on the prothorax show important variations. The scutellar bristles may be strong or weak, erect or horizontal, and vary greatly in number; they are usually marginal, but discal ones are sometimes present. There are bristles or hairs on the metapleurae of many species. On the wings there may be one or more strong costal bristles near the articulation. The bristles of the legs, when present, are variable; in some species they are large and strong, or short and thorn-like, arising from swellings on the under-side of the femora; the coxae may also be strongly bristled or haired, while on the tibiae are long or short spines; on the lower side of the front protarsi may be a row of minute teeth-like spines. The bristles of the abdomen are usually hair-like, but more conspicuous along the posterior margins of the segments.

The Empididae are predaceous and great hunters; none of them is large, and many are very small; their colours are inconspicuous. They are frequently found skimming over the surface of calm water, or dancing in swarms in the air; other species are solitary. Representatives of the family occur under most conditions, particularly on the foliage of bushes near water, or upon the rocks of streams; certain forms occur on sandy sea-coasts. The life-history of the family is but little known. The larvae of some have been found in the ground and among decaying vegetable matter, and it has been noted that some are carnivorous. It is probable that certain species are semi-aquatic, since a species of *Hemerodromia* has been found in the mud of a stream (Lundbeck).

The writer, while dissecting the abdomen of the female of *Hilara flavinceris* n. sp., found the ovaries filled with yellowish-brown eggs, each of which is oval with one end truncated and surrounded by a narrow rim (fig. 5); this end is covered by a whitish granular membrane from the middle of which is the micropilar projection (fig. 6); the surface of the egg is sculptured by hexagonal depressions.

The following synopsis is adapted to the species herein described only:—

TABLE OF GENERA.

1	{ Anal angle of wing not or but little developed (figs. 9, 18, 24, 33)	2
	{ Anal angle more or less developed	5
	{ Anterior coxae normal; two veins from cell 1st M ₂ owing to complete fusion of M ₁ and M ₂ ; R ₄ and R ₅ fused throughout	Subfam. OCYDROMIINAE, genus <i>Leptozeza</i> .*
2	{ Anterior coxae more or less lengthened, at least longer than the posterior; three veins from 1st M ₂ , or, when two, then M ₁ and M ₂ , fused for a space before branching; R ₄ and R ₅ may branch or be completely fused	3
Subfam. HEMERODROMIINAE.		
3	{ Anterior femora and coxae subequal, the anterior femora and tibiae spinose beneath; R ₄ and R ₅ fused or branched; Cu ₂ forming an angle with 1st A	4
	{ Anterior coxae not abnormally lengthened; legs slender; R ₄ and R ₅ branching; Cu ₂ and 1st A confluent forming a loop	<i>Trichopeza</i> .
	{ R ₄ and R ₅ fused throughout; 1st A more or less evanescent; three veins from cell 1st M ₂ ; cell Cu somewhat longer than cell M	<i>Litanomyia</i> .
4	{ R ₄ and R ₅ branching; M ₁ and M ₂ fused after leav- ing cell 1st M ₂ , but branching before the margin; 1st A strongly developed; cell Cu much shorter than cell M	<i>Hemerodromia</i> .
	{ Cu ₂ meeting 1st A at an acute angle, and not more or less parallel to the posterior wing margin .. .	Subfam. BRACHYSTOMATINAE, genus <i>Brachystoma</i> .
5	{ Cu ₂ recurved, being more or less parallel to posterior wing-margin and not forming an acute angle with 1st A	6
Subfam. EMPIDINAE.		
6	{ Metapleurae with hairs or bristles	7
	{ Metapleurae bare	8
7	{ Face bare	<i>Empis</i> .†
	{ Face more or less haired	<i>Empimorpha</i> .†
8	{ Vein Sc meeting the costa	<i>Hilara</i> .
	{ Vein Sc evanescent distally	<i>Hilarempis</i> .†

Subfamily HEMERODROMIINAE.

Anal angle of the wing not projecting, but weakly developed if at all; R₄ and R₅ may be fused throughout forming one vein (fig. 18), or branch toward the apex in the manner typical of the family (fig. 9); cell 1st M₂ may be narrowed apically owing to the elongated *m-cv* being more or less parallel to the posterior margin of the wing; or triangular, *m-cv* being almost in line with the first section of M₂; or rectilinear when the sides are practically parallel, M₁ and M₂ being fused for some distance before separating to the margin (fig. 9). There is also a considerable variation of the cell Cu; 1st A may be absent or represented by only a faint impression, although Cu₂ is distinct and curves down to meet it (fig. 18).

* *Leptozeza* is an exception to the general characters of the subfamily Ocydromiinae, since other genera of that group have the anal angle developed.

† In *Empis*, *Empimorpha*, and *Hilarempis* Sc is evanescent distally, but the hairs (often very indistinct) or bristles on the metapleurae separate the first two genera from the third.

When well developed, cell Cu may be looped anteriorly, owing to the confluence of 1st A and Cu₂ as one vein (fig. 24), or it may be truncated by Cu₂ being at right angles to 1st A (fig. 9). Further, cell Cu may be equal to, longer, or shorter than cell M.

Genus HEMERODROMIA Meigen.

The chief characters of this genus are the lengthened anterior coxae—these in length nearly equal their femora, which are thickened and spinose beneath; the elongated thorax; and the presence of two forked veins on the wing, M₁ and M₂ being fused for some distance beyond cell 1st M₂; the vein Sc, also, is evanescent at its apex.

H. fontanalis n. sp.

♀. Head globular, flattened above and below (fig. 7); eyes dichoptic, slightly emarginate at antennae; front cinereous, at times darker, with no bristles or hairs; ocellar triangle cinereous, with a pair of ocellar bristles; ocelli brownish-red. Antennae tawny; third joint fuscous in some lights, clothed with delicate tawny hairs, short, rather ovate but pointed apically, and terminating in a rather robust flagellum somewhat longer than the third joint itself. Face cinereous, clothed with scattered delicate hairs; elongate, very narrow, but broadening beneath at mouth. Proboscis brown, not as long as height of head; palpi pale grey. Occiput swollen, cinereous, with minute indistinct bristles over surface, and pair of distinct orbital bristles toward vertex.

Thorax elongated, black in ground-colour but clothed with cinereous pubescence arranged to form a pair of longitudinal darker narrow strips and an outer darker patch on each side; chaetotaxy as illustrated in fig. 8.

Wings (fig. 9) colourless, veins tawny, main veins thickened; Sc indistinct and evanescent apically; R₄₊₅ arising not much in front of origin of R₂₊₃; veins M₁ and M₂ confluent after leaving cell 1st M₂, but branching before reaching costa; 1st M₂ rectangular; cell M much longer than cell Cu, which is somewhat rectangular but pointed basally; Cu₂ at right angles to 1st A. Halteres pale yellow, almost white.

Legs pale tawny, middle and posterior pairs crowded posteriorly, anterior pair well separated from others; sternum of thorax flat. Anterior coxae considerably elongated, almost as long as their femora (fig. 10), which are somewhat swollen, with row of minute black teeth-like spines along lower side, but not extending to base, and a few widely spaced pale-yellow bristles to side; anterior tibiae somewhat thickened, not as long as femora, with row of minute teeth-like spines along lower edge, from each of which arises a small bristle; tarsi normal. Middle and posterior legs slender; all tarsi rather fuscous.

Abdomen black in ground-colour, with cinereous pubescence; terminal stylets shiny black.

♀. Length, 2.5 mm.

Holotype: ♀, No. 1223, D. M.

Habitat.—Rotorua, on banks of a stream.

Genus LITANOMYIA Melander.

The wing of this genus is characteristic; the anal angle is not developed; 1st A is obsolete, although Cu₂ is distinct and at right angles to the line of 1st A, the cell Cu being longer than cell M; cell 1st M₂ elongate; R₄ and

R_5 are fused throughout their length, and Sc is evanescent apically. Correlated with the absence of 1st A, the anterior coxae are longer than their femora, which are broadened and spinose beneath. The eyes are situated well forward on the head, and the occiput is well developed. In characterizing the genus, Melander states that the head is flattened and the eyes dichoptic in both sexes; acrostichal bristles absent and two scutellar bristles present. In the following species the head is flattened in the male only, and in this sex the eyes are closely approximated beneath the antennae; a pair of acrostichal bristles is present on the anterior part of the dorsum, and in the female, besides the two apical scutellar bristles, there are four on each angle of the scutellum. The occipital chaetotaxy varies in the male and female.

L. otiraensis n. sp.

♂. Head (fig. 11) dorso-ventrally flattened; eyes angulated at ocellar triangle and emarginate at antennae, dichoptic above antennae but closely approximated below, restricting the face and reaching to oral margin eliminating the cheeks. Ocellar triangle placed well forward on head; a pair of stout and conspicuous ocellar bristles. Front cinereous, comparatively broad, with a distinct orbital bristle on each side toward antennae; otherwise bare. Antennae situated in depression a little above middle height of head; black in ground-colour, but with greyish reflection; first joint short and inconspicuous but strongly bristled; second joint more or less globular and bristly; third joint rather clavate, flat, clothed with short delicate hairs; style a little more than three times as long as third joint, yellowish-brown, thickened at base, and clothed with delicate bristle-like hairs, giving it a barbed appearance except at tip, which is bare and hair-like.

Face narrow, convex, projecting in profile (fig. 11), clothed with dense silvery pubescence. Proboscis tawny, awl-like, slightly curved, not as long as height of head; palpi large, tawny, ultimate joint ovate, penultimate clavate. Occiput cinereous, flat and bristly above and clothed below with silvery bristle-like hairs along orbits; lower angle bristly; posterior orbits convex above but angulate about middle and thence concave to oral margin. Occipital chaetotaxy shown in fig. 13.

Thorax very elongate, dorsum narrow, chaetotaxy prominent and shown in fig. 15, except posterior to suture and in front of scutellum, where the specimen is pinned. Dorsum cinereous grey, owing to pubescence, with black stripe on each side and an indistinct brownish medium one; scutellum cinereous, bristles erect and convergent. Pleurae blackish-brown but clothed with cinereous pubescence; middle and posterior coxae approximated and set well back under base of abdomen, anterior legs attached anteriorly; metapleurae with pair of distinct bristles.

Wings (fig. 18) clear, anal angle weak, 1st A absent, Cu_2 distinct, forming right angle with line of 1st A; R_4 and R_5 fused; Sc evanescent for most part. Halteres tawny. Legs tawny, knees and apices of tarsi somewhat fuscous; anterior coxae (fig. 19) as long as their femora, which are broadened, and have two rows of long and short teeth-like spines beneath, between which tibiae fold; row of closely set, minute black spines along inner side of anterior tibiae; anterior tarsal joints, except the protarsi, slightly broadened.

Abdomen tawny, posterior margin of each segment broadly banded with fuscous; sparse vestiture of delicate tawny hairs; distinct bristles

toward posterior margin of each segment. Genitalia extruded but indistinct, tawny and bristly.

♀. Eyes dichoptic, front perpendicular, narrowing to antennae, black, orbits greyish-yellow, short owing to occiput invading crown of head so that ocellar triangle is on front of head (fig. 12). Face narrow, longer than front, protruding as in male, and clothed with dense yellow pubescence. Antennae inserted a little below middle line of head. Oral margin produced backwards and bristly. Occiput more or less evenly rounded; chaetotaxy shown in fig. 14; short bristle-like hairs below foramen and in deep concavity of posterior orbits. Lower orbits truncated.

Thorax somewhat rectangular in outline, particularly in profile (fig. 17); prothorax yellowish-brown, to black in some lights; dorsum (fig. 16) greyish-yellow or brown, with velvet blackish-brown stripe on each side; medianally is a broad deeper-yellow stripe, bordered on each side by a narrow, less distinct, slate-grey one; median colour-pattern distinct only anterior to transverse suture. Outside lateral blackish-brown stripes thorax is yellowish-grey edged with blackish-brown. Humeri, from above, truncated and yellowish-grey. Scutellum greyish-yellow, with four marginal bristles at each angle in addition to apical pair. Metathorax brownish-yellow, but black in some lights. Pleurae silvery-grey in colour, with blackish-brown areas in certain light (fig. 17). Owing to sternopleurae being produced posteriorly and being closely applied to hypopleurae, not only are pteropleurae crowded upwards between meta- and sterno-pleurae, but middle and posterior legs arise close together immediately posterior to root of wings (which are attached well back on thorax) and beneath base of halteres, a space equal to about length of dorsum intervening between anterior and middle legs, which are attached to extreme anterior lower angle of thorax. Chaetotaxy conspicuous, and shown in figs. 16 and 17; pleurae bare except for five metapleural bristles.

Legs yellow, coxae with whitish reflections; knees, tibiae of middle and posterior legs, and all tarsi somewhat darker; anterior coxae a little longer than their femora.

Abdomen brownish-yellow, with bristle-like hairs on posterior margin of each segment; pale-yellowish hairs along sides; brown terminal stylets covered with stiff bristle-like hairs.

♂. Length, 2 mm. ♀. Length, 3 mm.

Holotype: ♂, No. 1253; ♀, No. 1225, D. M.

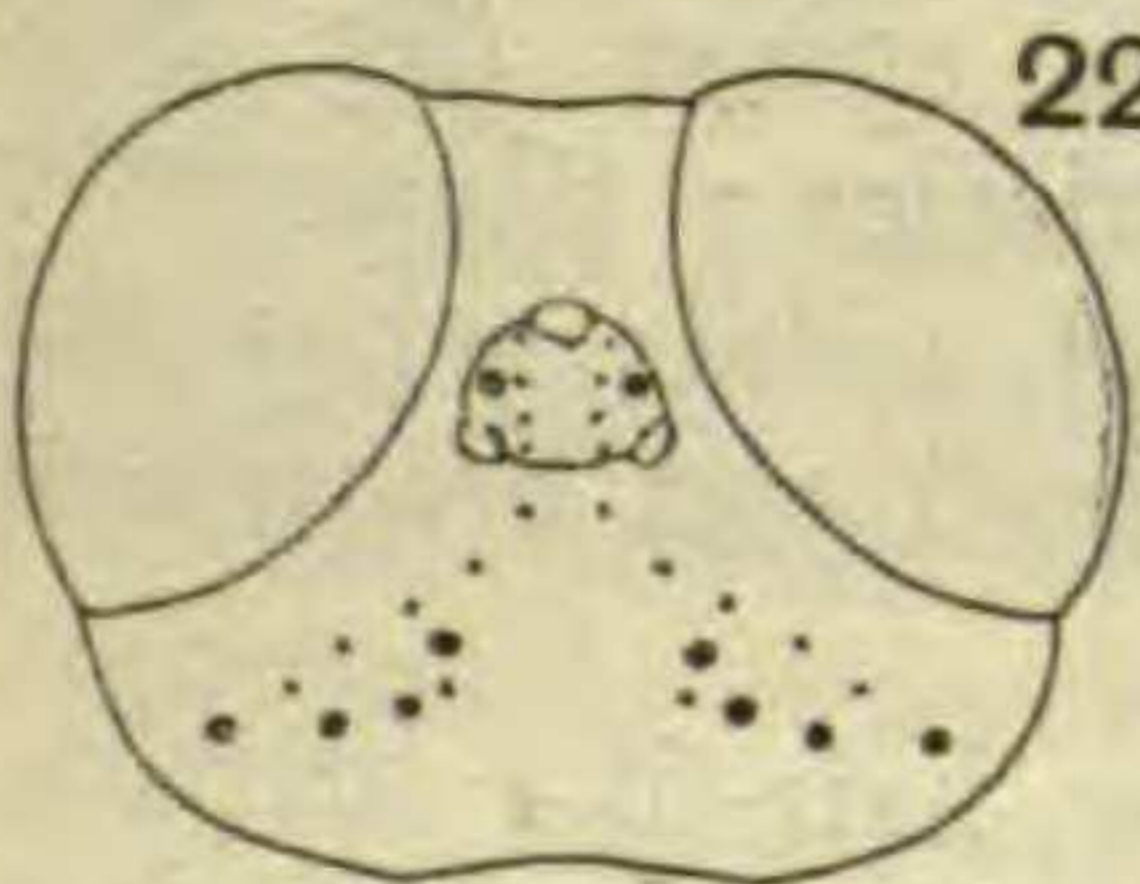
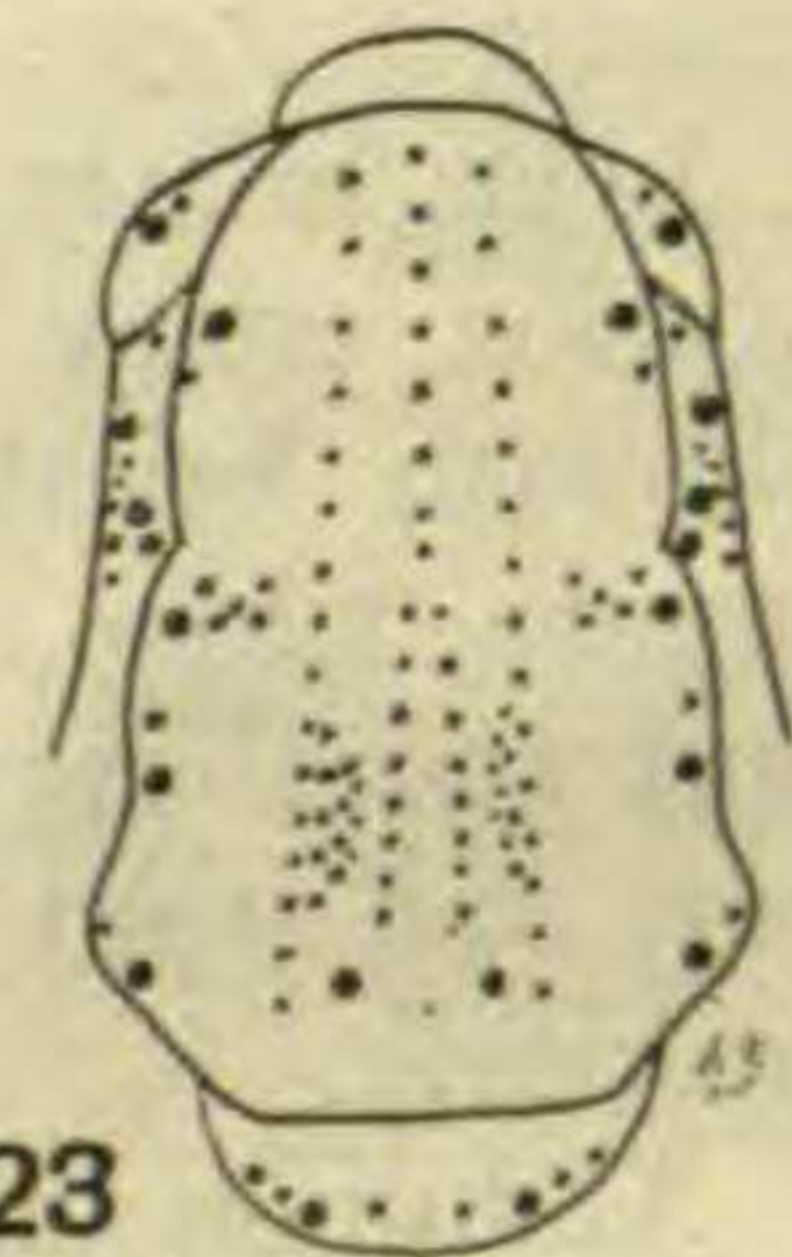
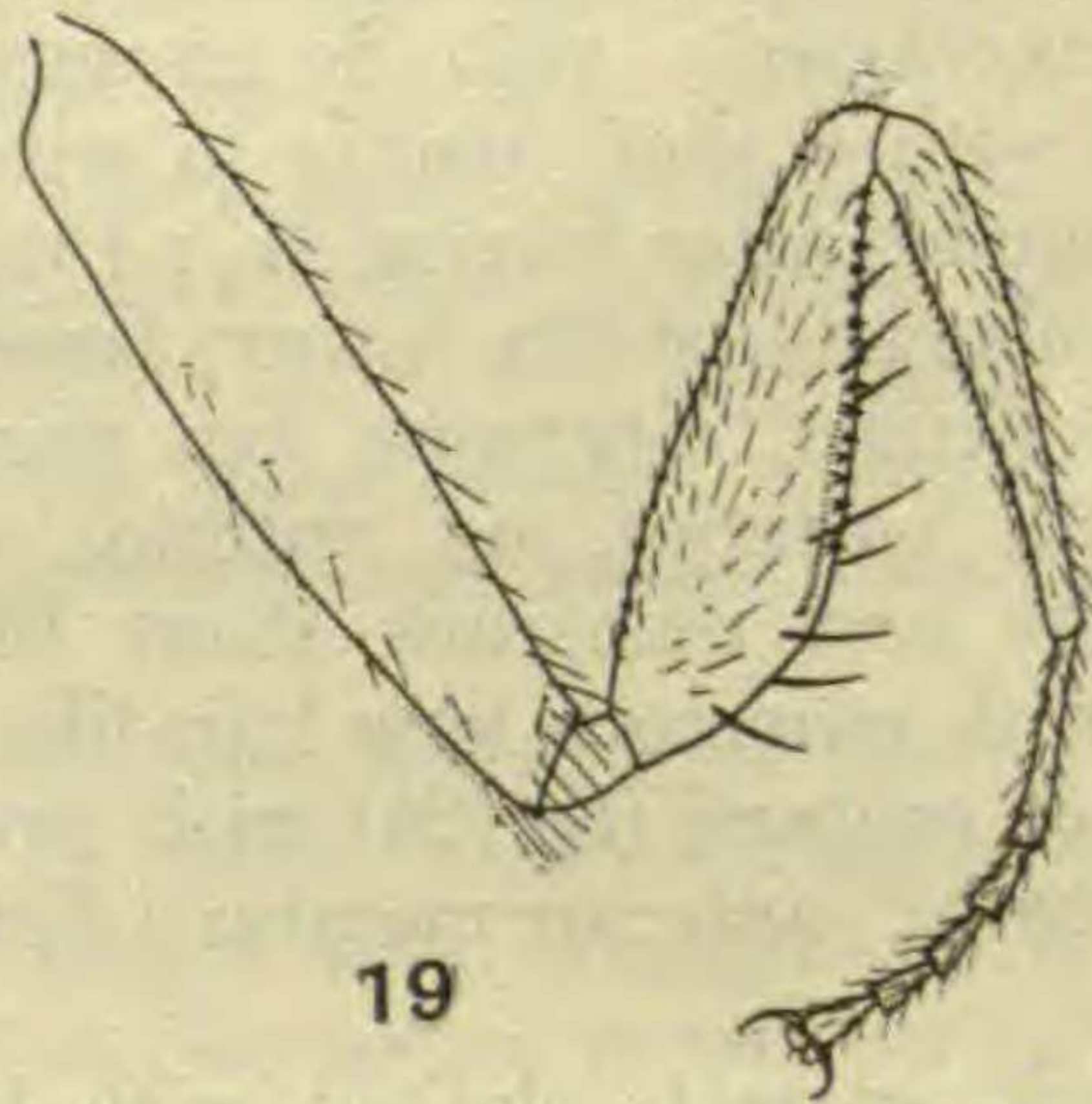
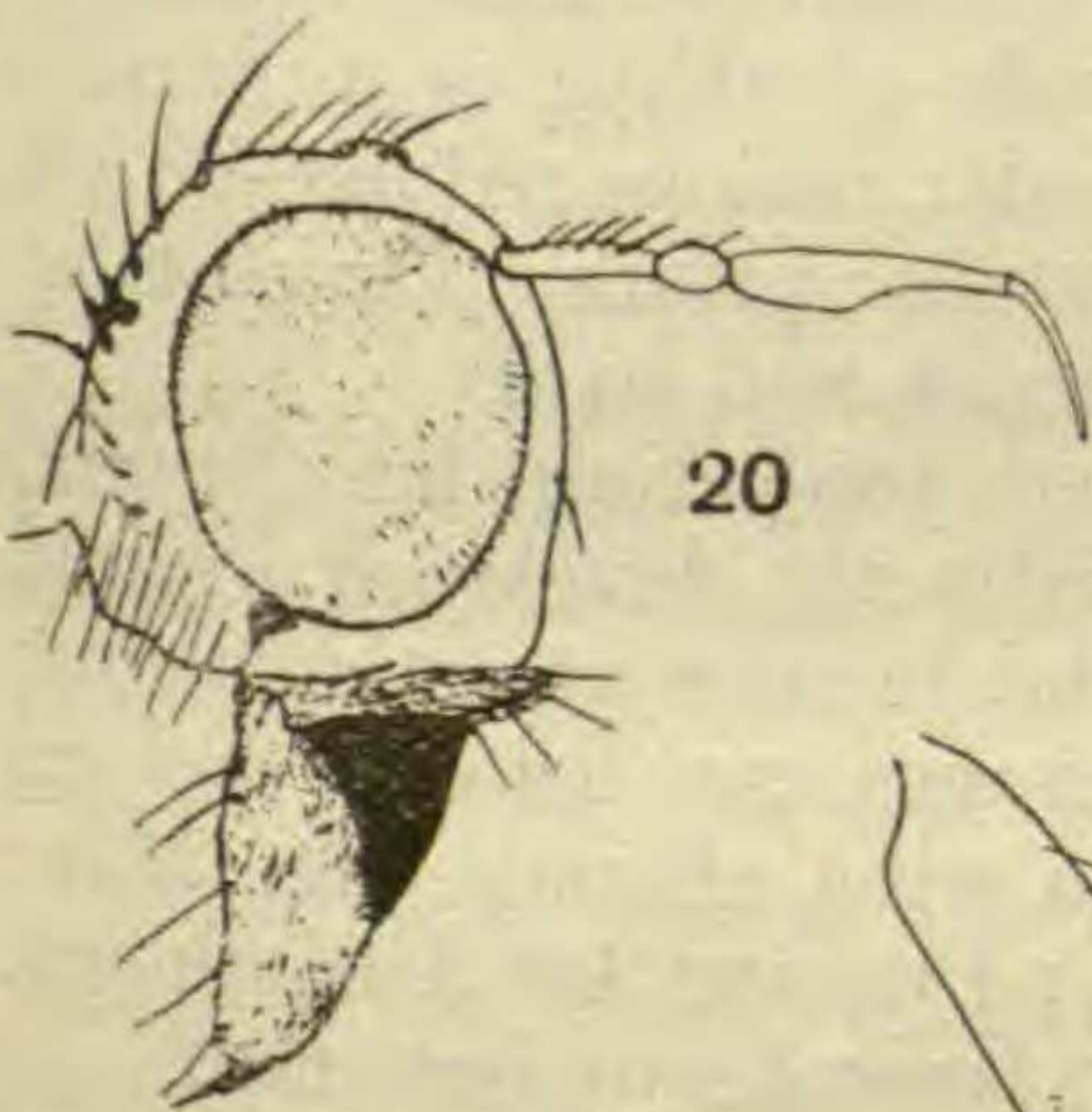
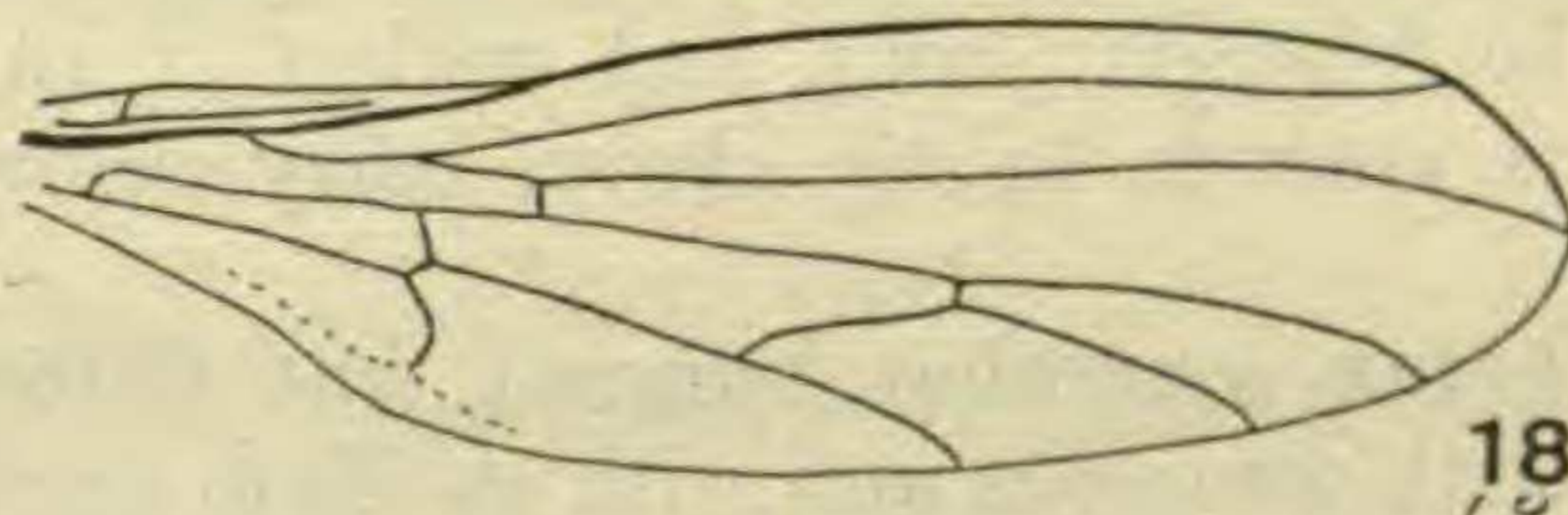
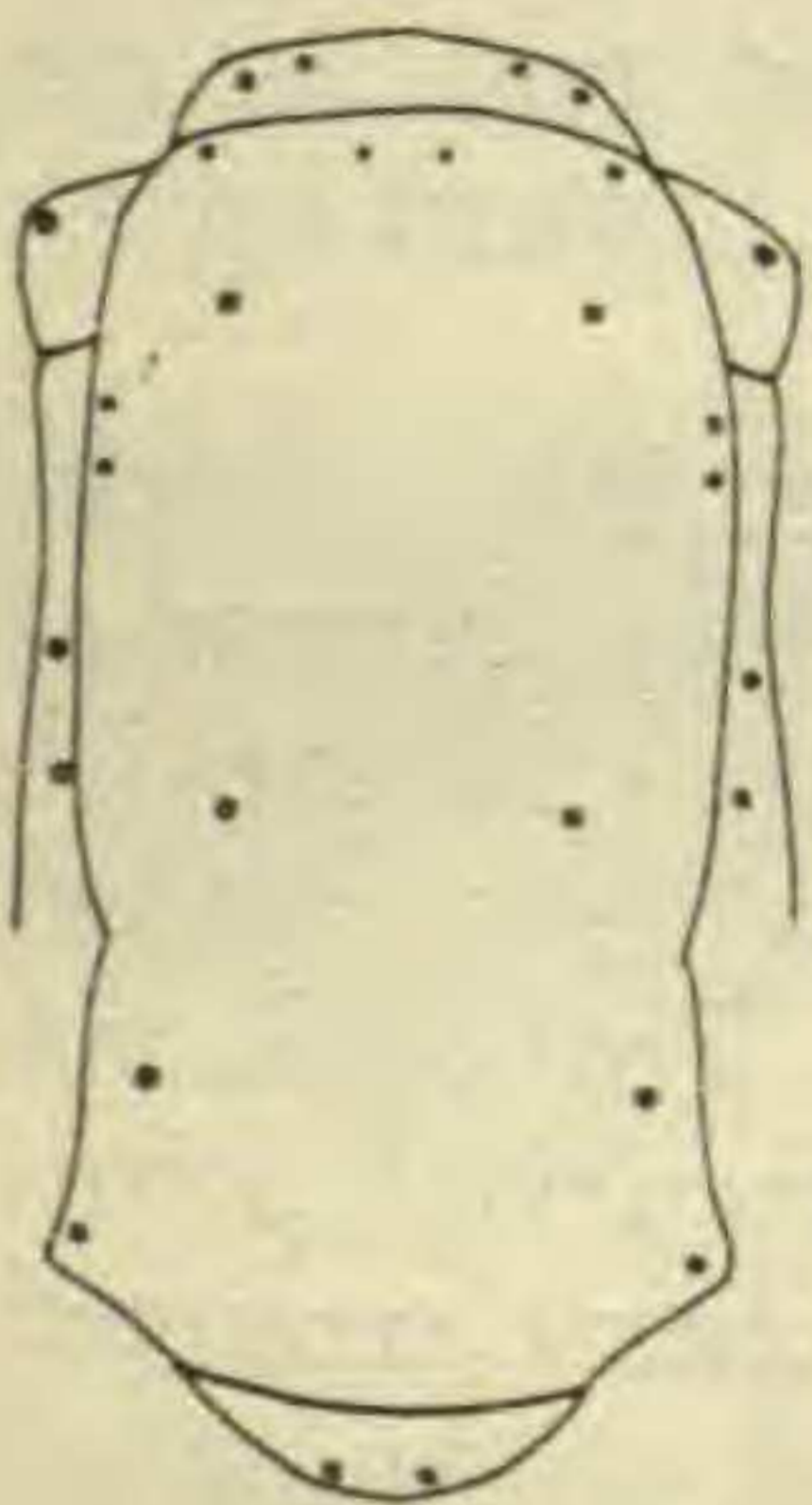
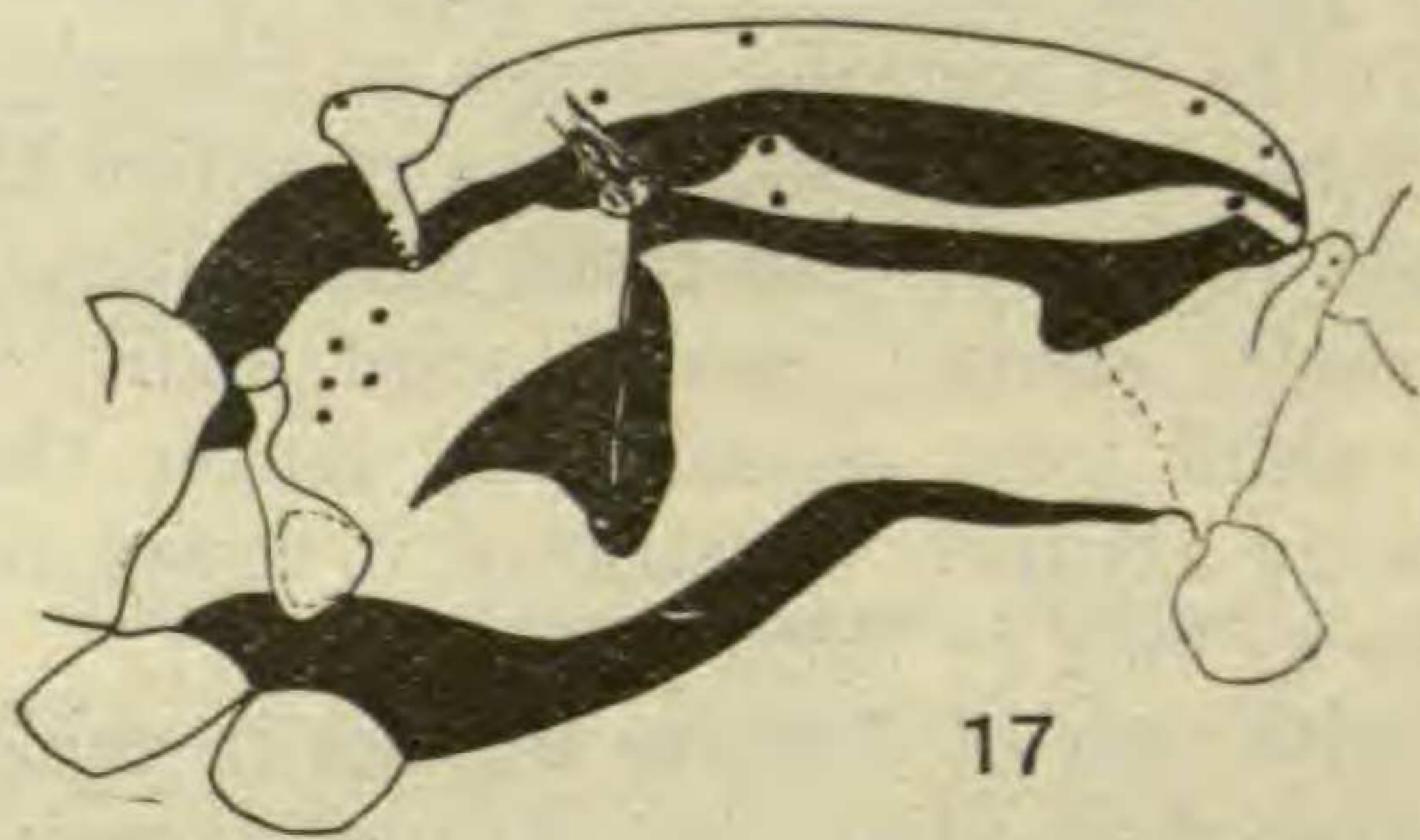
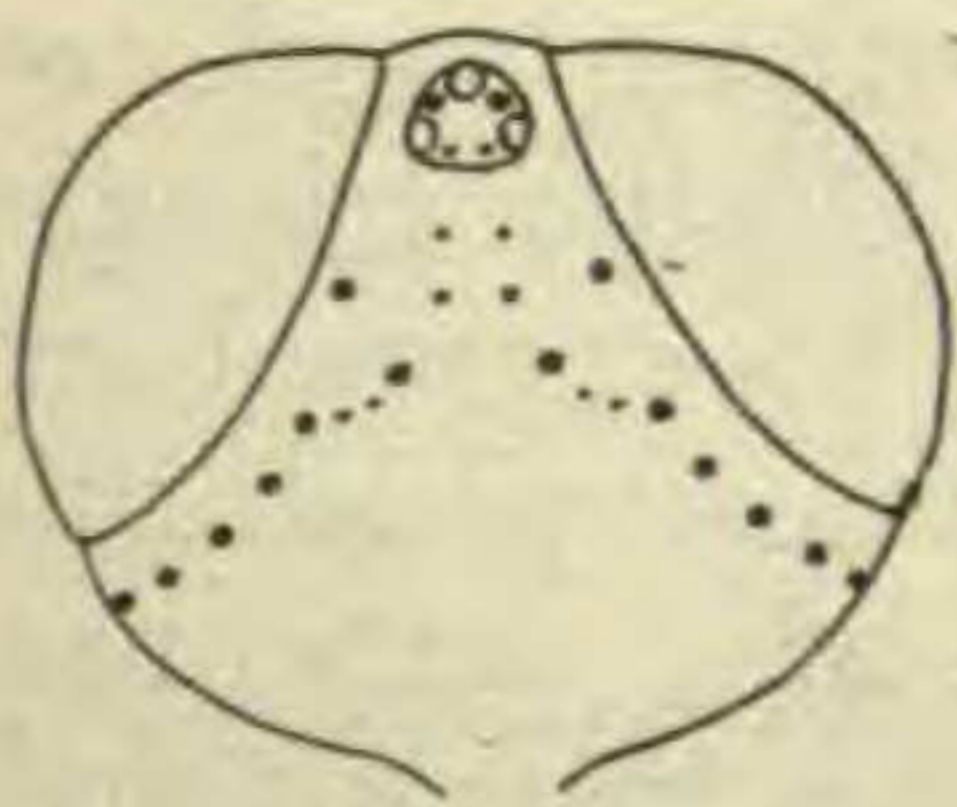
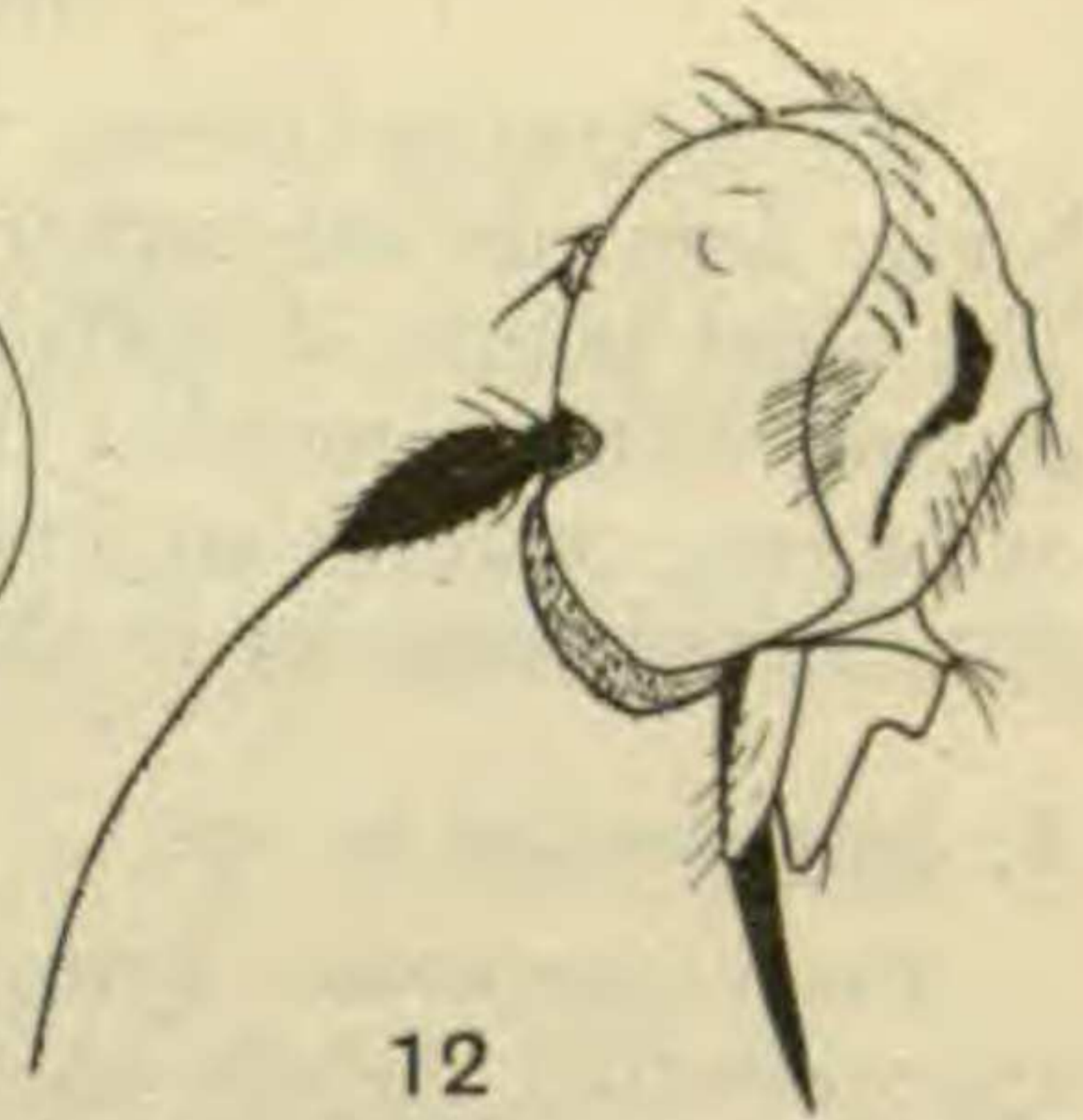
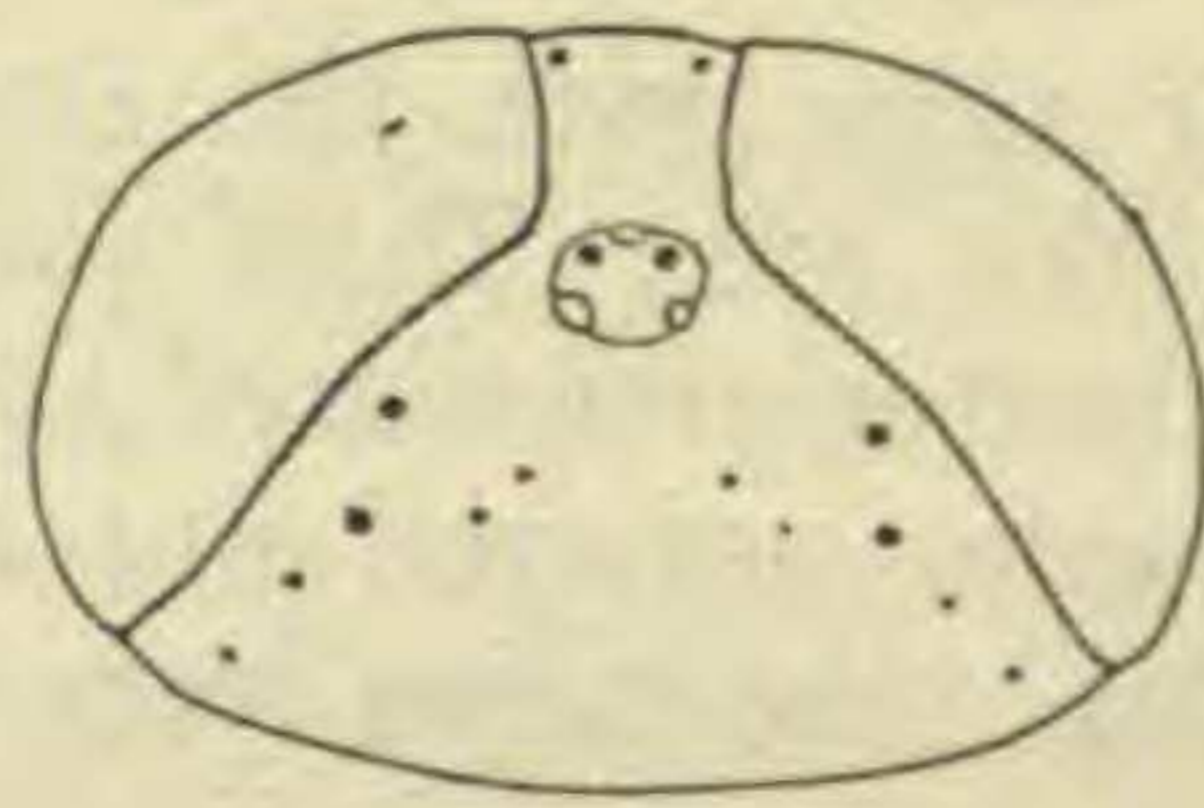
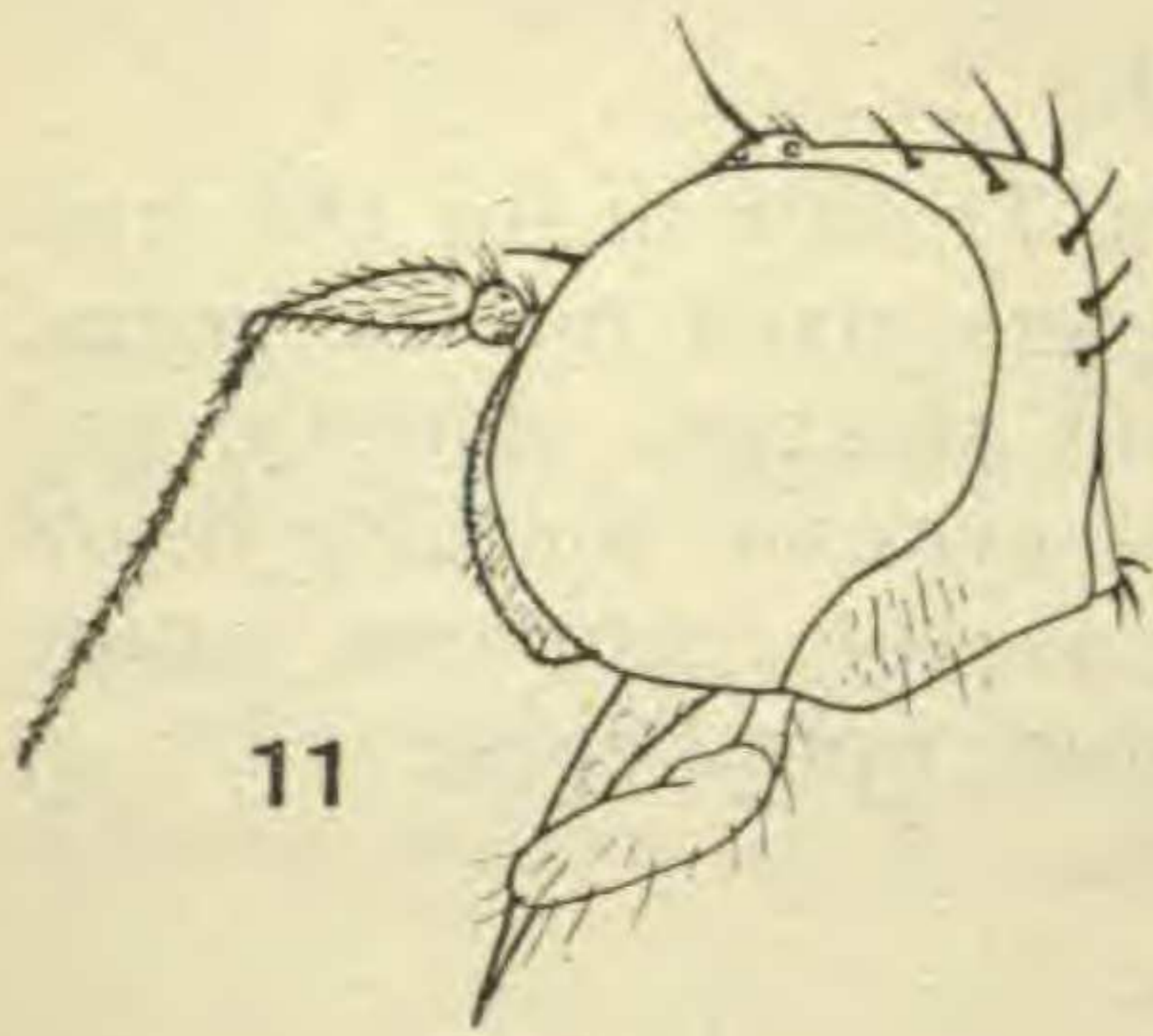
Habitat.—Otira (J. W. Campbell); Weraroa, amongst swamp vegetation.

FIGS. 11-19.—*Litanomyia otiraensis* n. sp.

11. Head, side view, ♂.
12. Head, side view, ♀.
13. Occiput, showing chaetotaxy, ♂.
14. Occiput, showing chaetotaxy, ♀.
15. Dorsum of thorax, showing chaetotaxy, ♂.
16. Dorsum of thorax, showing colour-pattern and chaetotaxy, ♀.
17. Thorax, showing colour-pattern and chaetotaxy of pleurae and part dorsum, ♀.
18. Wing.
19. Anterior leg.

FIGS. 20-23.—*Trichopeza longipennae* n. sp.

20. Head, side view.
21. Antenna.
22. Occiput, showing chaetotaxy.
23. Dorsum of thorax, showing chaetotaxy.



Genus TRICHOPEZA Rond.

The following species, which I have placed in *Trichopeza* for the time being, does not altogether agree with the characters given for the genus. The chief points of difference are: Third joint of antennae elongate and clavate with a somewhat shorter articulated style; eyes not touching below antennae; acrostichal bristles uniserial anterior to the transverse suture but biserial posterior to this; the tibiae have a stout apical spine.

T. longipennae n. sp.

Head cinereous; eyes minutely hairy, slightly emarginate at antennae, approximated slightly on middle of front, which is short, without vestiture but with an indistinct brownish transverse median band. Ocellar triangle situated a little forward of middle of top of head, owing to encroaching occiput (fig. 20); a pair of conspicuous ocellar bristles, between which run two rows of small bristles to posterior margin of triangle (fig. 22). Antennae longer than width of head, above middle line of which they are inserted and closely approximated (fig. 20); cinereous and minutely pubescent; first joint long, with bristles above; second joint short and globular, bristly above and below; third joint considerably longer than first and second together, clavate, being abruptly constricted in lower margin toward apex; flagellum three-fifths as long as third joint (fig. 21).

Face cinereous, with pair of delicate bristles in middle (fig. 20); cheeks narrow, cinereous, eyes descending close to oral margin; a deep furrow at lower eye-margin toward posterior oral angle, which bears long stiff greyish hairs extending on to lower occiput. Palpi greyish-black, densely clothed with greyish pubescence and with long rigid greyish hairs. Proboscis not quite length of head-height, stout, and ending in an acute recurved point. Occiput cinereous, convex, bristly above, hairy below, chaetotaxy arranged as in fig. 22.

Dorsum of thorax somewhat humped, but flattened before scutellum; black-margined, with cinereous and with medium grey stripe which broadens over the flattened area posteriorly; on each side of stripe is a narrow indistinct pale one, seen only in certain lights; alar regions reddish-brown in some lights, with a greyish stripe running to scutellar suture. Chaetotaxy distinct and arranged as in fig. 23; pleurae cinereous and bare.

Wings (fig. 24) much longer than body and projecting far beyond abdomen, slightly tinged with brown; costa distinctly developed around posterior margin; numerous long and strong costal bristles at articulation; anal angle not strongly developed; vein Sc evanescent before reaching costa; R_4 angulated and with a short stump in wing of male (fig. 24A); in female R_4 is strongly rounded after leaving R_5 ; Cu_2 and 1st A confluent, forming a loop. Halteres elongate, stalks tawny, large heads brownish.

Legs bristly, long and slender, cinereous, but tarsi merging to black; anterior coxae longer than posterior, on anterior surface clothed with yellowish bristle-like hairs and numerous stout black spines (fig. 25). Femora, tibiae, and tarsi with numerous long hair-like bristles; tibiae with stout apical spine; anterior protarsi (fig. 26) with row of widely separated short and stout spines beneath; anterior metatarsi flattened and broadened anteriorly.

Abdomen cinereous-black, sparsely clothed with long hair-like bristles, denser along posterior margin of each segment, on each side of which is a black circular depression. Male genitalia black, projecting, structure obscure (fig. 27); apex of female abdomen ending in pair of broad lamellae (fig. 28).

♂. Length, 4.5 mm. ♀. Length, 5 mm.

Paratypes: No. 1251, D. M.

Habitat.—Otira (J. W. Campbell).

Subfamily OCYDROMIINAE.

Veins R_4 and R_5 fused throughout; M_1 and M_2 either distinct or fused throughout—*i.e.*, there may be two or three veins running from cell 1st M_2 . In some genera Cu_2 is recurrent or forms a right angle with 1st A. The anal angle is weak or strongly developed.

Genus LEPTOPEZA Macq.

Cell 1st M_2 present; veins M_1 and M_2 fused throughout; Cu_2 not forming an acute angle with 1st A, the cell Cu being shorter than cell M; anal angle rounded, not strongly developed. Antennae short, three-jointed, the third joint broad at the base but pointed apically and terminated by a long bristle-like style.

TABLE OF SPECIES.

(a.) A black fly with tawny legs	.. .. .	<i>nigra</i> n. sp.
(b.) An orange-yellow fly with abdominal segment branded with fuscus	.. .. .	<i>fulvescens</i> n. sp.

Provisional Table based on Chaetotaxy.

(a.) One pair of scutellars; four weak prothoracics on each side (fig. 35); occipitals in two rows, the outer stronger, the inner weaker, and ending in a pair of weak verticals on each side of ocellar triangle (fig. 34)	.. .. .	<i>fulvescens</i> n. sp.
(b.) Two pairs of scutellars; two weak prothoracics on each side (fig. 32); occipitals in two rows, the outer weaker, the inner stronger, and not reaching vertex; a weak bristle close to orbit opposite the terminal one of the inner row (fig. 31)	.. .. .	<i>nigra</i> n. sp.

L. nigra n. sp.

♂. Perpendicular axis of head long; eyes situated well forward, emarginate at antennae, below which they are holoptic, face being almost completely eliminated (fig. 29); above antennae eyes are closely approximated, the black front in consequence being very narrow; ocellar triangle broad, reaching from eye to eye, black, ocelli golden; a pair of conspicuous ocellar bristles. Antennae situated high up on head, black; first and second joints short and of about equal length (fig. 30), both clothed with minute hairs, second globular and with fringe of bristles; third joint longer than first and second together, flat, broad basally but pointed apically, and clothed with short and delicate grey hairs; arista very long, bristle-like, and minutely setose. Face black, extremely narrowed owing to eyes being holoptic for some distance below antennae and thence closely approximated; cheeks eliminated by eyes; only apex of mouth-parts projecting; proboscis brownish and palpi black. Occiput large, convex, cinereous-black; clothed with greyish hairs below, bristly above; chaetotaxy shown in fig. 31.

Thorax humped, cinereous-black, but practically black in some lights; pleurae bare, lighter in colour than dorsum, which is clothed with short delicate bristles and larger ones arranged as in fig. 32. (The course of acrostichals toward scutellar suture is lost owing to position of pin through the only specimen.) Four bristles on scutellum, the two outer ones shorter and more delicate than the apical pair, which are long and convergent.

Wings (fig. 33) iridescent, slightly tinged with yellow, anal angle not strongly developed; 1st A continued toward margin; Cu_2 inclined to evanesce at its junction with 1st A; vein Sc evanescent before reaching costa; veins R_4 and R_5 fused throughout; M_1 and M_2 fused; a spurious vein in cell Cu; surface and costa of wing distinctly bristly. Halteres tawny.

Legs tawny and bristly; upper surface of femora and apical joints of tarsi darker; front femora with row of strong bristles on inner side; posterior femora with delicate bristles on lower side and strong pre-apical lateral one; middle tibiae with strong pre-apical bristles and strong lateral one near middle and another on upper side above middle; posterior tibiae with apical bristles and strong one on upper side slightly beyond middle; posterior protarsi rather thickened.

Abdomen blackish-brown, sparsely clothed with short delicate bristles, and a system of long hair-like ones along the posterior margin of each segment.

♂. Length, 3.5 mm.

Holotype: No. 1252, D. M.

Habitat.—Silverstream, Dunedin (E. Clarke).

L. fulvescens n. sp.

♀. Eyes closely approximated along front, deeply emarginate at antennae; ocellar triangle prominent, black with a greyish reflection and a pair of conspicuous ocellar bristles; front narrow but widening slightly to antennae, black, but brownish in some lights, and with greyish pubescence longer at antennae, which are inserted a little above middle height of head; first and second joints of about equal length, black but clothed with greyish pubescence and fringe of bristles; third joint elongate, clavate, clothed with greyish pubescence and terminated by pubescent style not abnormally long nor unusually slender. Face narrow, black, and clothed with a short silvery pile which becomes yellow at oral margin. Proboscis brown, short, and stout; palpi tawny, apical joint broad and ovate. Occiput black, clothed with cinereous pubescence, the hairs below tawny, chaetotaxy above arranged as in fig. 34.

Thorax orange-yellow, vitreous, narrow black streak running from humerus to wing; metanotum blackish-brown. Very few bristles on

FIGS. 24–28.—*Trichopeza longipennae* n. sp.

24. Wing of ♀.
- 24A. Wing of ♂, showing stump-vein on R_4 .
25. Anterior coxa, ♂.
26. Anterior tarsus, ♂.
27. Genitalia, ♂.
28. Apex of abdomen, ♀.

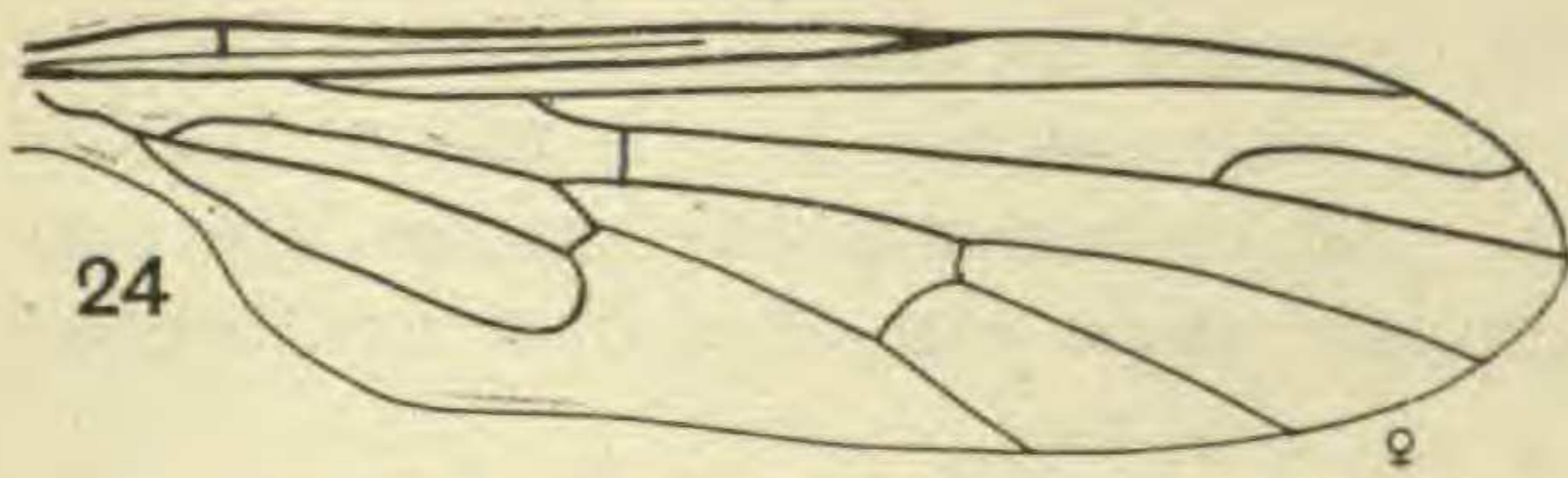
FIGS. 29–33.—*Leptopeza nigra* n. sp.

29. Head, front view, ♂.
30. Antenna.
31. Occiput, ♀, showing chaetotaxy.
32. Dorsum of thorax, showing chaetotaxy.
33. Wing.

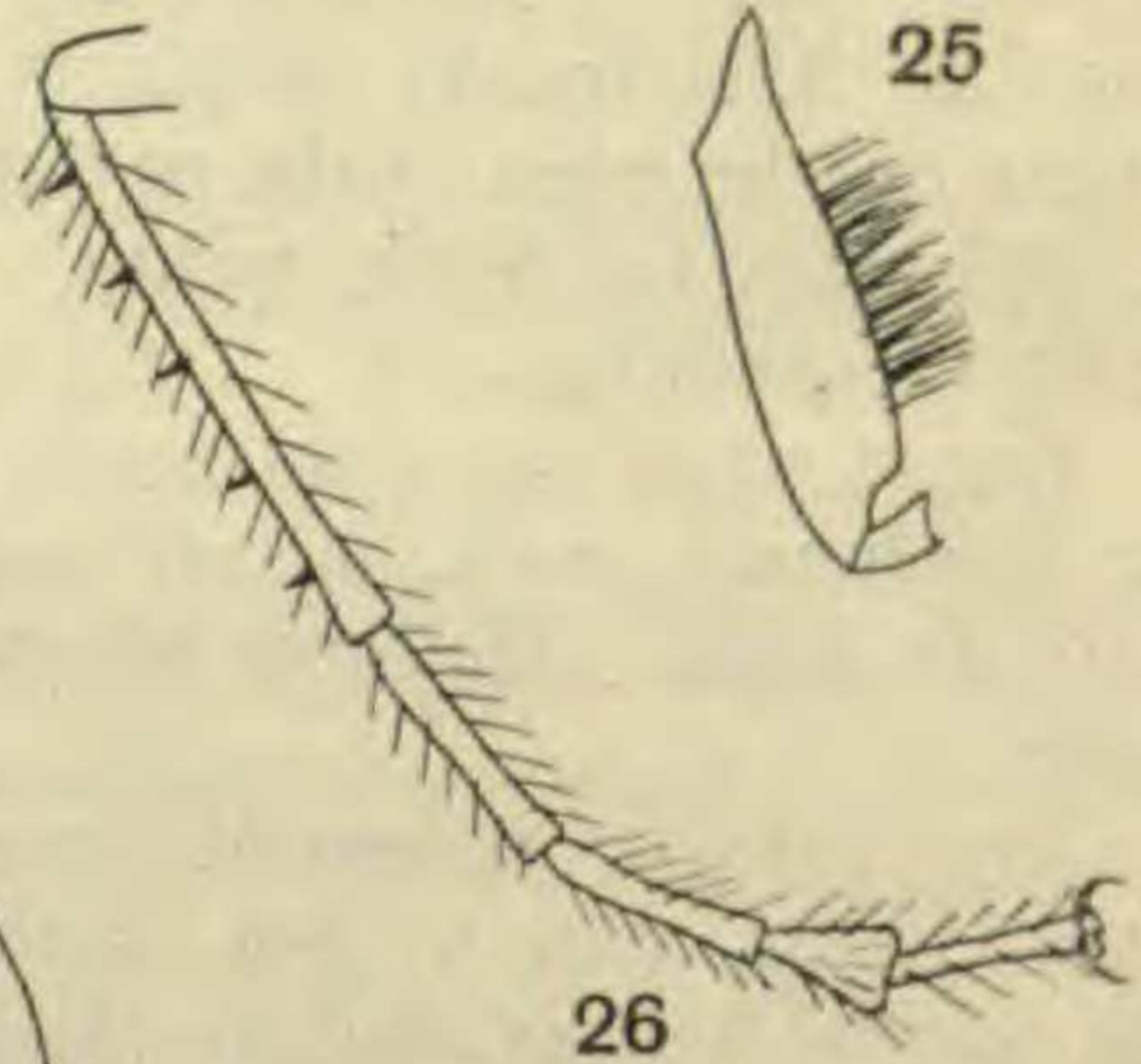
FIGS. 34–36.—*Leptopeza flavescens* n. sp.

34. Occiput, ♀, showing chaetotaxy.
35. Dorsum of thorax, showing chaetotaxy.
36. Posterior femur, ♀.

FIG. 37.—*Brachystoma adelensis*: Wing.

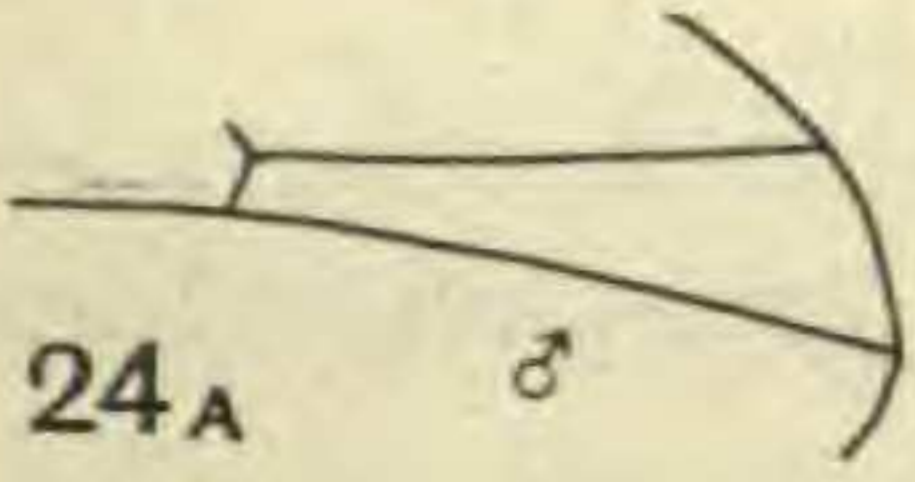


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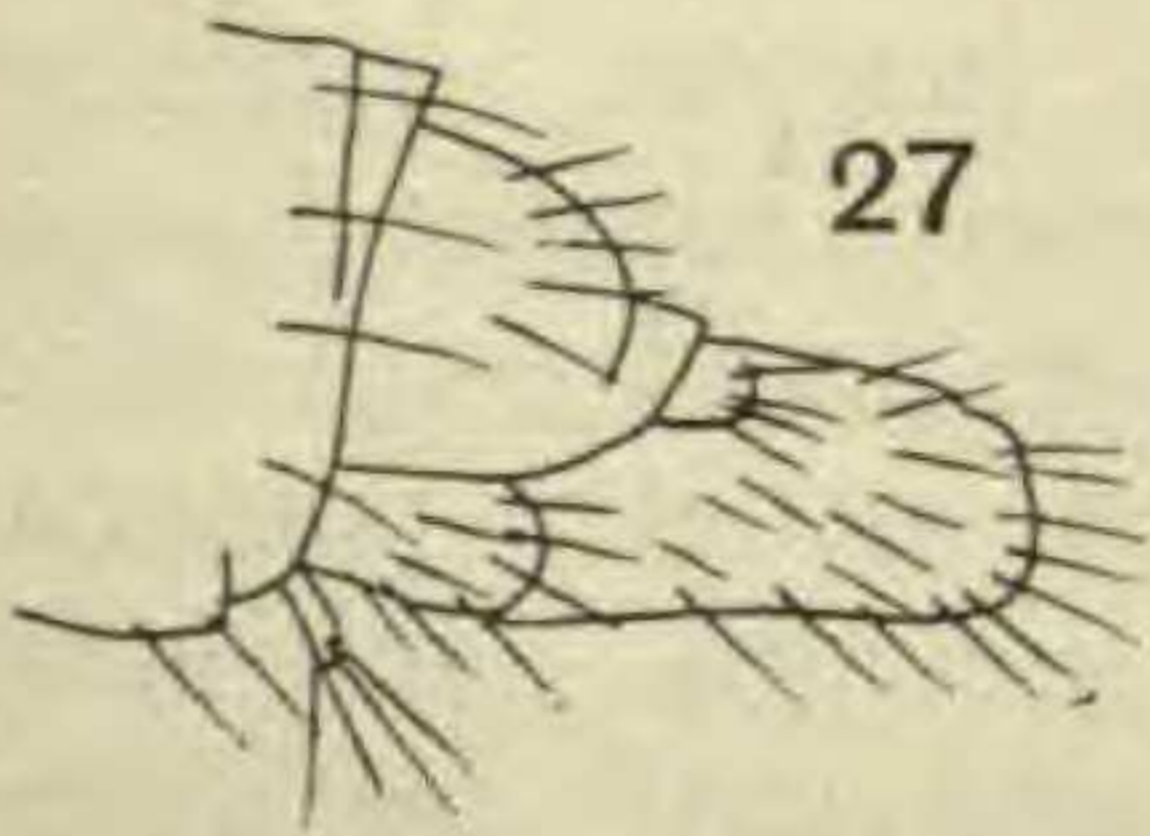
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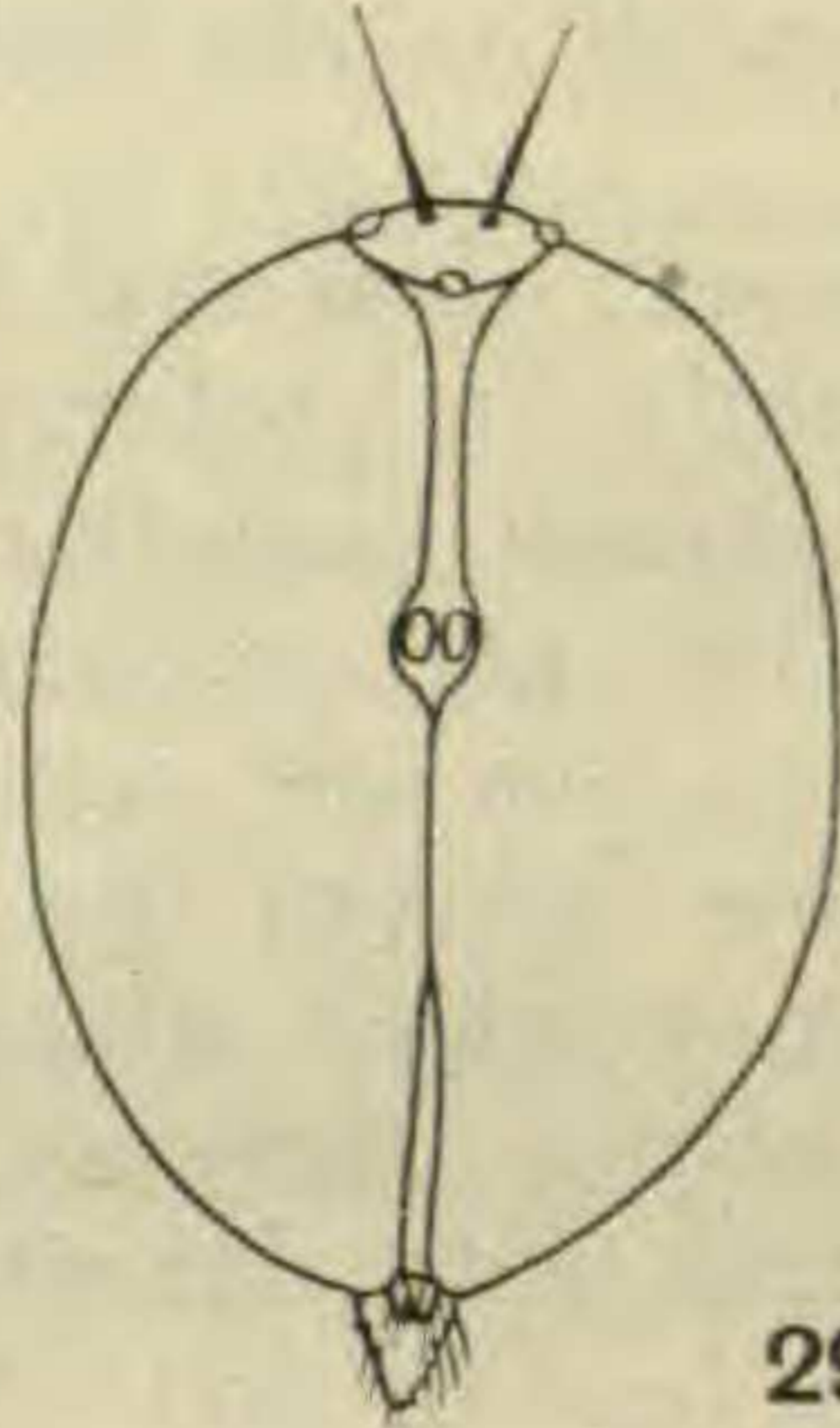


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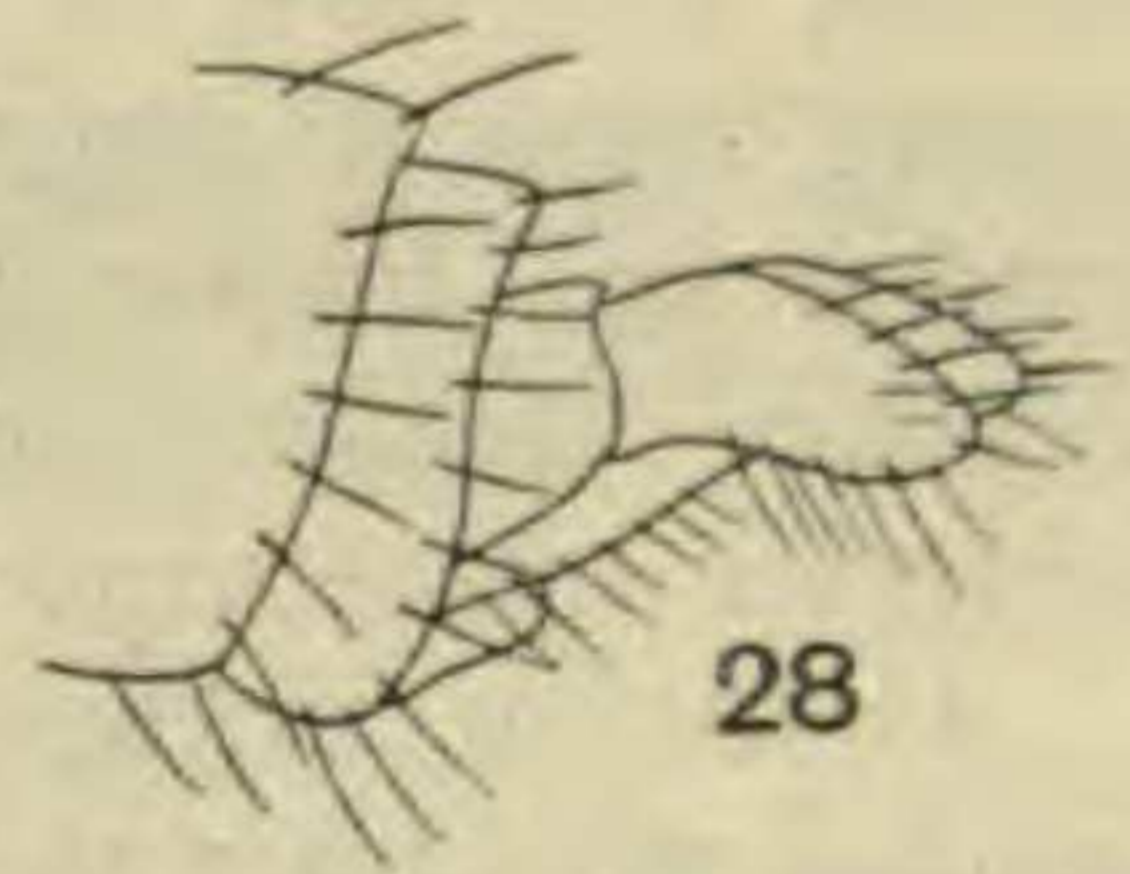
♂



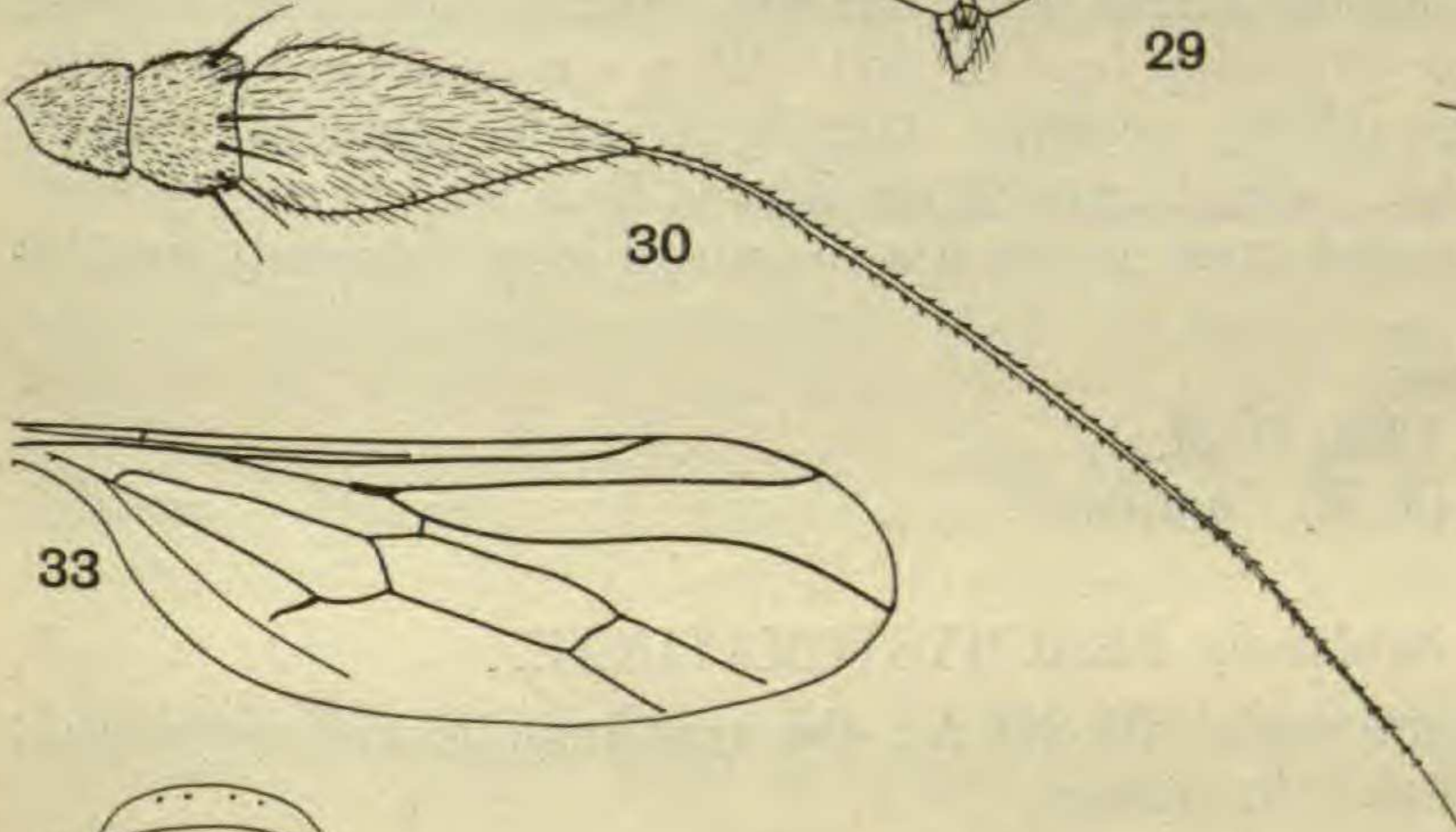
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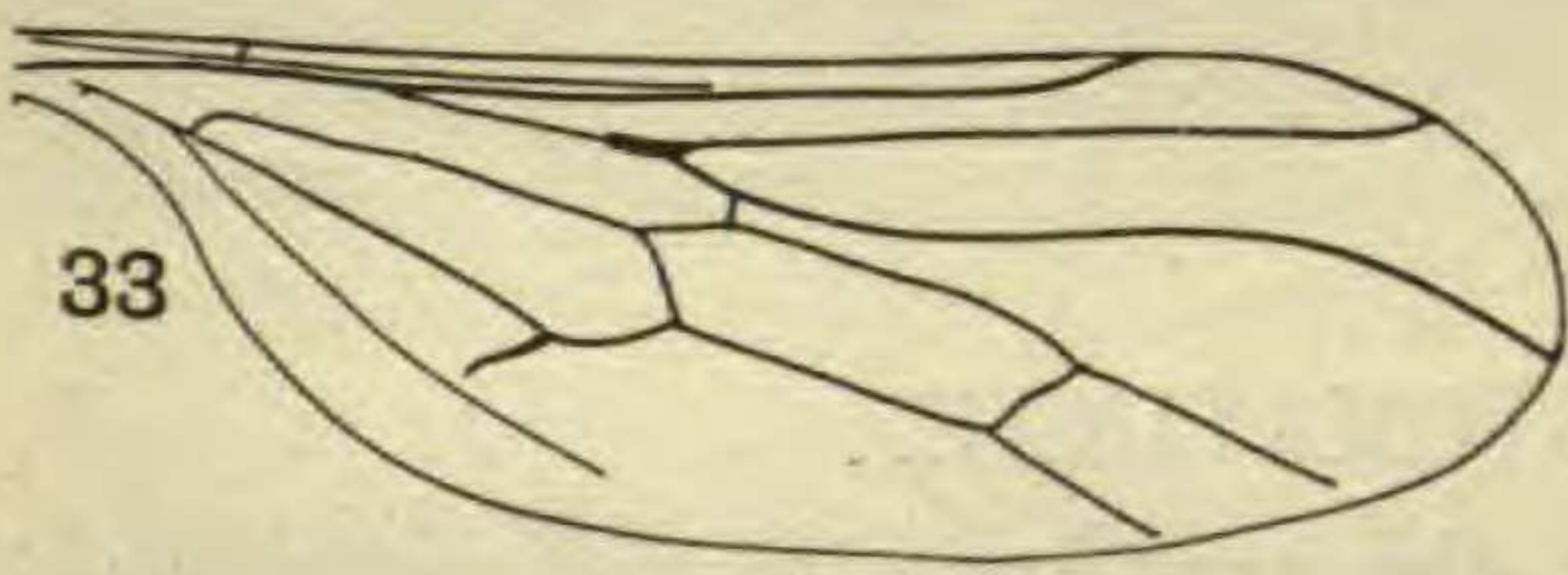
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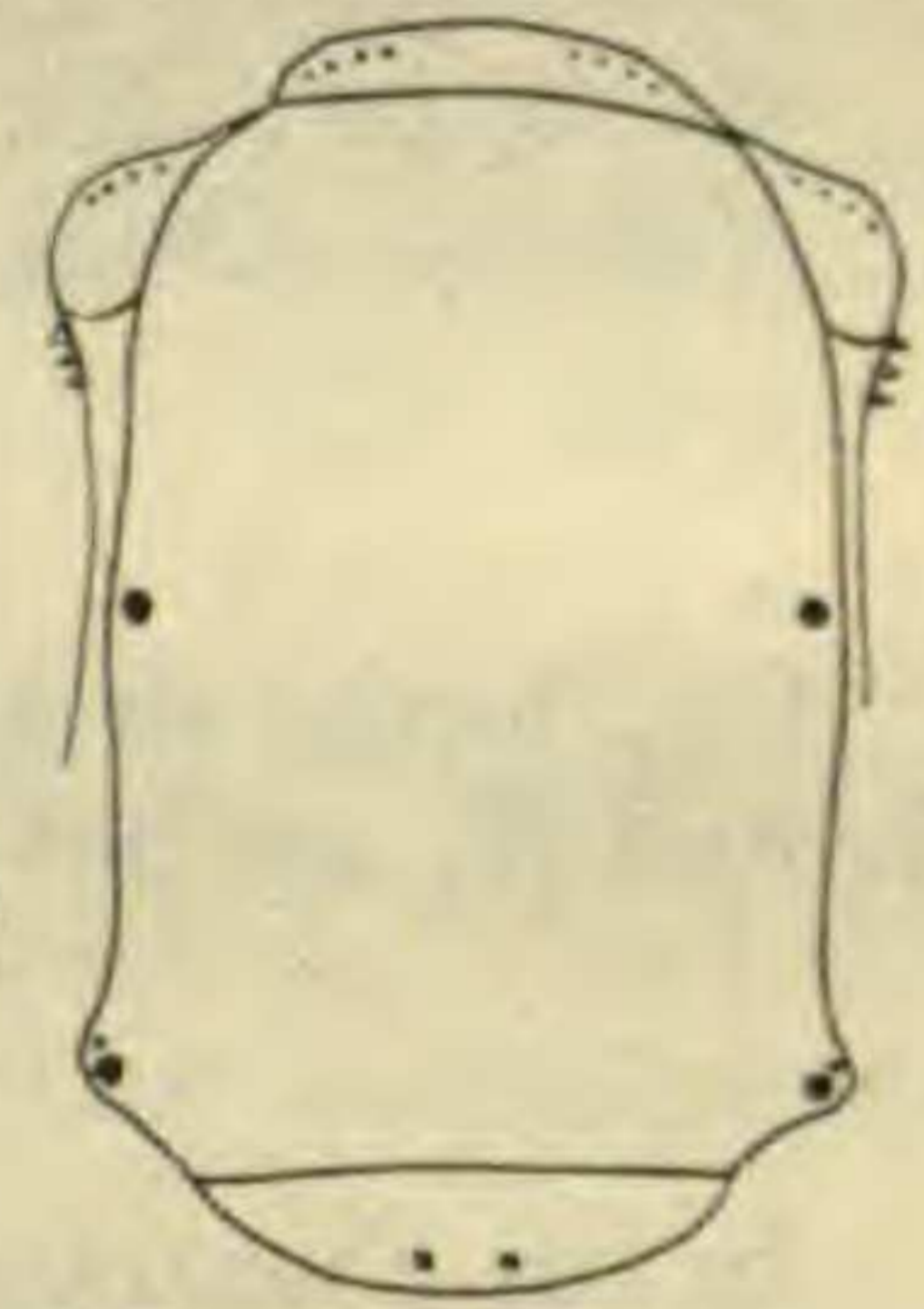
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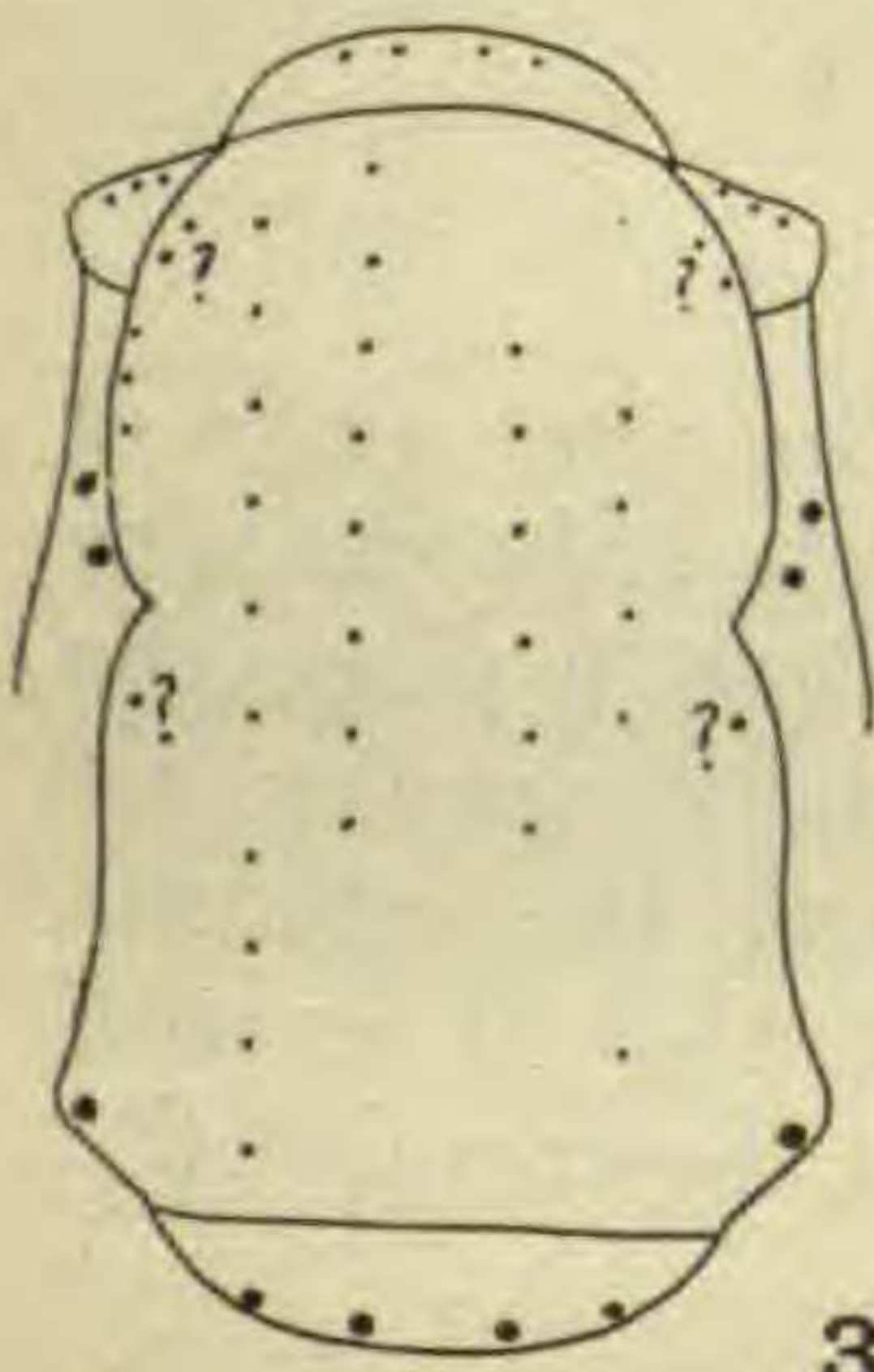
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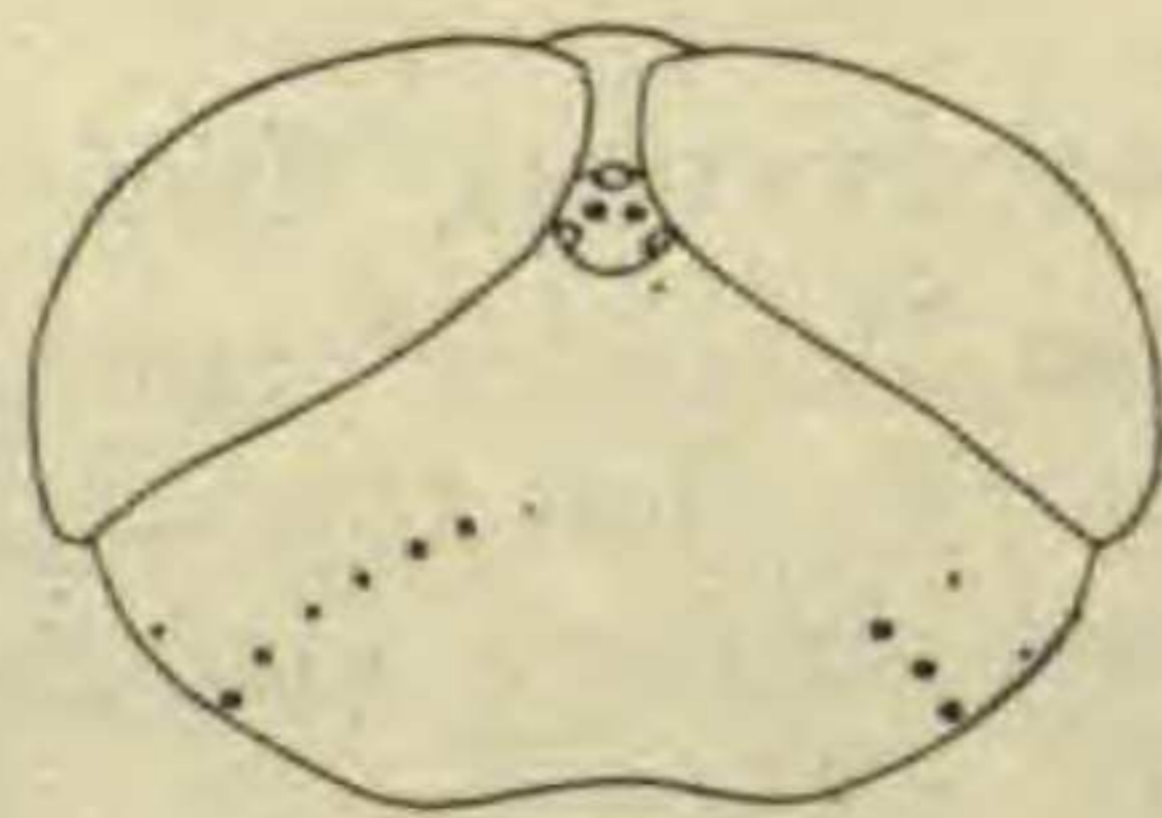
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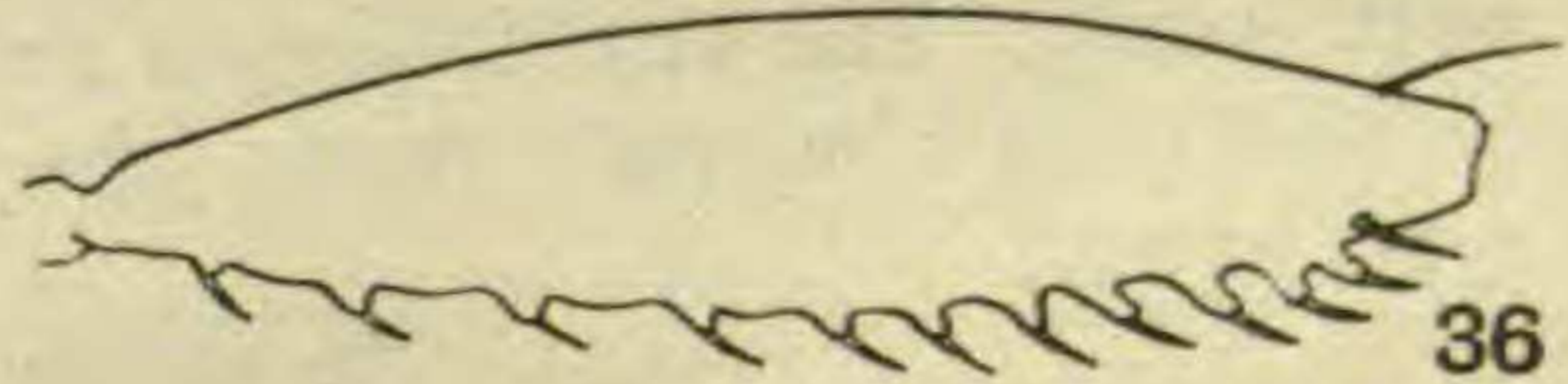
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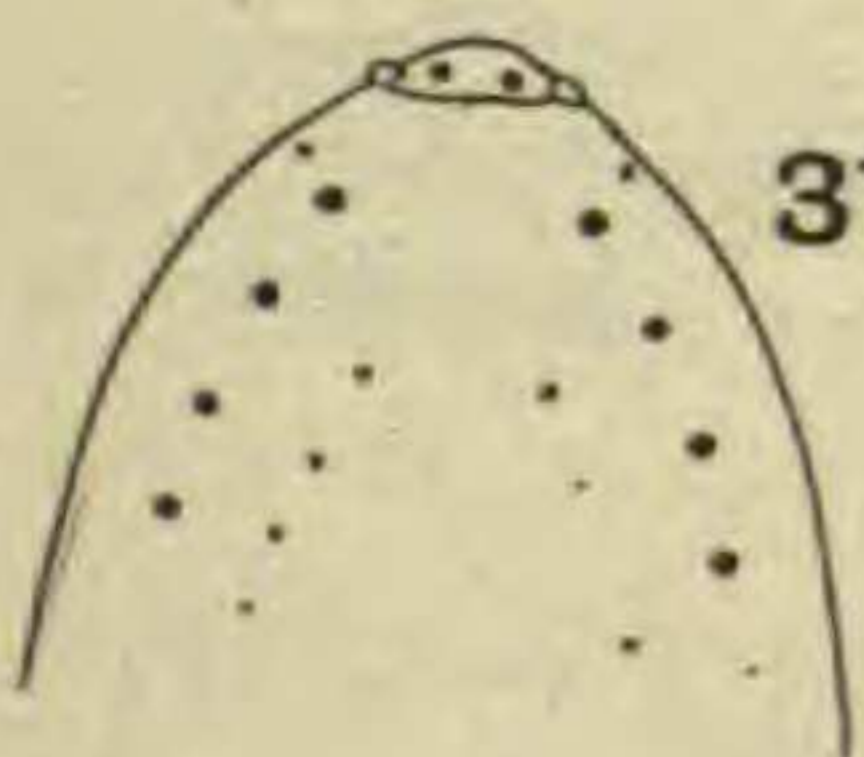
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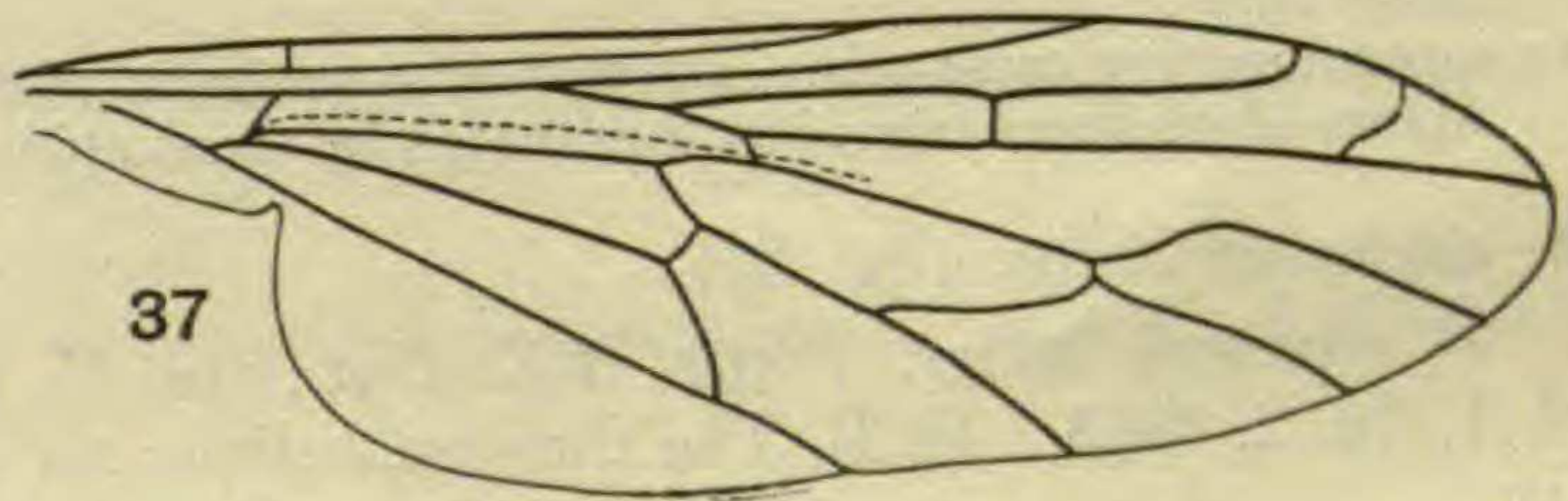
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31



37

dorsum, but several systems of delicate hairs, some representing the acrostichals; but the dorsum is too much damaged by the pin to give a definite account. Chaetotaxy, as far as possible, shown in fig. 35. A unique feature is that on the edge of the notopleurae, just posterior to the humeri, are very minute black teeth-like spines. There is a single pair of erect apical bristles on the scutellum.

Wings with the anal angle more pronounced than in *L. nigra*; vein 1st A, though weak, is continued well to the margin; venation otherwise as in *L. nigra*. Halteres brownish on the stalks but with greenish-yellow heads.

Legs tawny; apices of femora, tibiae and proximal tarsal joints, apical tarsal joints, and a spot distally on posterior femora fuscous. Anterior and middle femora slightly thickened, posterior strongly so; middle femora with row of bristles beneath but not extending to apex, and with three lateral pre-apical bristles, two on one side and one on the other; posterior femora with row of stout spines beneath (fig. 36), to one side, each spine arising from a prominence along which tibiae close, and with pre-apical bristles and bristle-like hairs above. Anterior tibiae clothed with delicate hair-like bristles; middle tibiae with delicate bristles and apical ones; posterior tibiae more delicately bristled and with a stronger pre-apical one.

Abdomen orange-yellow, posterior margin of each segment broadly banded with brownish; apical segment terminated by a long narrow process which has black rounded apex giving rise to pair of long delicately-bristled styles.

♀. Length, 4.5 mm.

Holotype: No. 1254, D. M.

Habitat.—Otira (J. W. Campbell).

Subfamily BRACHYSTOMATINAE.

Cu_2 forms an acute angle with 1st A; the anal angle is well developed; R_4 and R_5 are not fused throughout.

Genus BRACHYSTOMA Meigen.

In his characters of this genus Melander* states that the anal angle of the wing is gone, while Shiner† asserts that this angle projects (*Flugellappen vortretend*). It is upon the latter author's classification that I place the following species in *Brachystoma*, although the eyes of both species are not holoptic, but widely separated beneath and holoptic above the antennae in both sexes. The two following species agree so closely that it is with some hesitation I separate them; the genitalia of the males, however, differ to some extent.

TABLE OF SPECIES.

A supernumerary cross-vein connecting veins R_{2+3} and R_{4+5} ; claspers of ♂ genitalia with a row of strong spines along the inner edge	..	<i>adelensis</i> .
No supernumerary cross-vein; claspers of ♂ genitalia without strong spines along inner edge, but terminated by stout spines	..	<i>hamiltoni</i> n. sp.

B. adelensis Miller (fig. 37).

B. adelensis Miller, *Trans. N.Z. Inst.*, vol. 45, p. 203, figs. 11 to 14, and pl. 1, fig. 2, 1913. (N.B. The dimension-lines are reproduced twice natural size.)

Holotype: ♂, No. 786, D. M.

* Mono. N. Amer. Empididae, *Trans. Amer. Ento. Soc.*, vol. 28, p. 259, 1902.

† *Fauna Austriaca, Die Fliegen*, 1 Th., p. 117, 1862.

B. hamiltoni n. sp.

Eyes holoptic on front in both sexes, covering sides and top of head. Antennae inserted about middle line of head, prominent, densely pubescent, blackish-brown, a golden pubescence particularly noticeable on style, which is two-jointed, basal joint short, terminal joint ending in short naked spine-like process, the two joints together being about as long as clavate third antennal joint (fig. 38). Face bare, short, shorter than broad, greyish-white but blackish along orbits. Cheeks bare, cuneiform, concave, blackish with greyish reflection. Occiput flat, somewhat depressed above foramen but rather swollen beneath and slightly descending at posterior oral margin; black in ground-colour but with distinct greyish-yellow tomentum, sparsely clothed with delicate yellowish-brown hairs below and row of delicate short black orbital bristles above foramen. Ocellar triangle prominent, blackish-brown, ocelli golden; pair of prominent ocellar bristles. Proboscis and palpi withdrawn, blackish-brown with somewhat lighter reflections; apex of proboscis shiny black; palpi bristly.

Thorax distinctly humped in profile; prothorax and humeri greyish-yellow, the former dusky on each side in certain lights; dorsum velvet-brown, a greyish-yellow stripe on each side, with reddish tinge, extending from humeri to alar angles, outside of which is a velvet-brown narrow stripe from humeri to wing-bases; alar angles greyish-yellow; a broad light-brown medio-longitudinal stripe (indistinct in some lights except at scutellum) extending from near prothorax and broadening toward scutellum, which is greyish-yellow; in certain lights the darker colours of dorsum merge in front of scutellum into the lighter; metathorax greyish-brown. Dorsum bare except for a few small bristles (fig. 39), the series toward root of wing, however, being large and conspicuous; a fringe of delicate, rather reclinate bristles along anterior margin of prothorax; scutellum with fringe of delicate bristle-like hairs.

Wings (fig. 40) clouded with brown, more so apically, a clear space on each side of stigma which is opaque-brown; veins brown; anal angle prominent; R_4 not strongly recurved; no supernumerary cross-vein between R_{2+3} and R_{4+5} ; apex of cell Cu somewhat obtuse in comparison with that of *B. adelensis*. Halteres light-yellow.

Legs black with silvery rather yellowish-grey reflection, which is particularly persistent on coxae. Middle legs shorter than others and with swollen femora; anterior and posterior legs slender but apex of tibiae and protarsi slightly thickened. Leg chaetotaxy as in *B. adelensis*.

Abdomen blackish-brown with delicate pale hairs at sides; basal and second segments greyish-brown, and a greyish-brown triangular area toward posterior angles of each segment, upon which is a paler brown and indistinct band; this pattern seen only in certain lights. Male genitalia (fig. 41) black, claspers bristly and each terminating in stout bristles; their inner edges not spined; median ventral process bare and shiny; whole genitalia directed upwards. A pair of spots on sides of each abdominal segment except first; on second segment a double row on each side along posterior margin.

♂. Length, 8 mm. ♀. Length, 8.5 mm.

Syntypes: No. 1226, D. M.

Habitat.—Te Wairoa. A very common species in vicinity of waterfall.

[Subfamily EMPIDINAE.

Anal angle of wing developed; Cu_2 forming an obtuse angle or confluent with 1st A; cell 1st M_2 present; vein Sc complete or evanescent apically; R_4 and R_5 fused throughout or branching.

Genus HILARA Meigen.

Anterior protarsi of male usually enlarged; proboscis not longer than but about as long as head-height; vein Sc meeting costa; R_4 and R_5 branching; metapleurae bare.

TABLE OF SPECIES.

1	{ Thorax tawny, with indistinct darker stripes; abdomen brownish-yellow, the posterior margin of each segment tawny; genital appendage of δ nearly as long as body; length of body, 6 mm.	<i>\delta flavinceris</i> n. sp.
	{ Thorax not tawny; greyish or blackish species	2
2	{ Altogether cinereous or greyish species with yellow legs	3
	{ Blackish species	5
3	{ Altogether a cinereous littoral species; length, 2.25 mm.	<i>philpotti</i> .
	{ Body greyish, legs yellow	4
4	{ Wings tinged with yellow	φ <i>smithii</i> .
	{ Wings clear; a long genital appendage	δ <i>vector</i> n. sp.
5	{ Wings tinged with brown	6
	{ Wings hyaline	7
6	{ A narrow-bodied fly; δ without genital appendage; length, 6 mm.	<i>fumosa</i> .
	{ A small fly; δ with a short genital appendage; length, 4 mm.	<i>fossalis</i> n. sp.
7	{ Genitalia of δ distinct, recurved over apex of abdomen, but without genital appendage; length, 3.75 mm.	δ <i>littoralis</i> n. sp.
	{ Genitalia of δ with a distinct appendage; length not less than 5 mm.	8
8	{ Genital appendage short; length of body, 5.5 mm.	<i>hudsoni</i> .
	{ Genital appendage nearly as long as body; length of body, 6 mm.	δ <i>dracophylli</i> n. sp.

Provisional Table based on Chaetotaxy.*

1	{ Two pairs of scutellars	2
	{ At least three pairs of scutellars	3
2	{ Acrostichals biserial and strong; dorsocentrals uniserial and strong (fig. 52); occipitals in two rows, the two vertical ones of inner row outstanding (fig. 51)	<i>fumosa</i> .†
	{ Acrostichals absent; dorsocentrals biserial(?), the inner row regular and weak, the outer irregular in size (fig. 55); occipitals weak, in two rows, three on each side of vertex strong (fig. 54)	<i>fossalis</i> n. sp.
3	{ Three pairs of scutellars; acrostichals weak, forming at least four rows; dorsocentrals uniserial, terminal ones outstanding, remainder weak (fig. 57)	<i>smithii</i> .
	{ More than three pairs of scutellars	4
4	{ Five pairs of scutellars; acrostichals weak, in at least four rows; dorsocentrals weak, biserial (fig. 49); occipitals in three rows, the outer triserial, weak but for two strong orbitals (one of which is a vertical) and one strong post-vertical on each side (fig. 48)	<i>vector</i> n. sp.
	{ Four pairs of scutellars and sometimes a pair of discals	5
5	{ Acrostichals absent; dorsocentrals uniserial, weak but ending posteriorly in a strong bristle; the outer and pre-apical scutellars outstanding (fig. 46); occipitals weak, in four rows	<i>littoralis</i> n. sp.
	{ Acrostichals present	6
6	{ Apical scutellars weak, sometimes a pair of discals present	7
	{ Scutellars uniform, no discals present (fig. 43)	<i>flavinceris</i> n. sp.
7	{ A pair of scutellar discals sometimes present; marginal scutellars, except weak apical pair, uniform; dorsocentrals ending posteriorly in a pair of large bristles before scutellum (fig. 50)	<i>dracophylli</i> n. sp.
	{ Apical scutellars weak, the pre-apicals outstanding; no discals present; dorsocentrals ending in two pairs of outstanding bristles posteriorly	<i>hudsoni</i> .

* *H. philpotti* is not included.† It is doubtful if *H. fumosa* belongs to this genus.

H. philpotti Miller.

H. philpotti Miller, *Trans. N.Z. Inst.*, vol. 45, p. 202, figs. 9 and 10, 1913.

In fig. 10 the vein Sc should not be evanescent, but should meet the costa, though indistinctly. The cone-shaped protuberance referred to in the original description is really the very short genital appendage.

H. flavinceris n. sp.

♂. Eyes emarginate at antennae, narrowly approximated for a distance on front below ocellar triangle, which is prominent and tawny, but greyish-brown pruinose to black in some lights; ocelli orange; a pair of short ocellar bristles and several minute ones behind (fig. 42). Front very narrow at approximation of eyes but broadening below to antennae, gently descending along eye approximation but almost vertically from thence to antennae, thus angulate in profile; tawny and greyish-brown pruinose; a double row of delicate and short hair-like orbital bristles, not extending to line of antennae, which are inserted about the middle line of head; first and second joints tawny and greyish-pruinose, with delicate bristles, first somewhat longer than second; third joint of both antennae lost. Face bare, coloured as front, slightly longer than broad, oral margin not extending very close to antennae. Cheeks very much restricted and inconspicuous, clothed with tawny hairs. Proboscis orange-yellow to brown, equal to or a little less than height of head; palpi tawny, clothed with delicate tawny hairs basally and with a few long bristle-like tawny hairs below apically. Occiput convex, greyish-yellow, with darker reflections due to minute pubescence; a broad area along each orbit clothed with short black bristles merging into long golden stiff hairs below; in bristly area toward vertex is a regular system of chaetae (fig. 42).

Thorax tawny, greyish-yellow pruinose, pleurae black in some lights; dorsum somewhat arched, testaceous in some lights, with four darker longitudinal stripes seen when light falls from in front; chaetotaxy as in fig. 43, there being very few strong bristles; pleurae bare except propleurae, which are clothed with delicate yellow hairs extending on to humeral areas. Scutellum with triangular testaceous area at base, otherwise tawny, with four pairs of erect marginal bristles.

Wings faintly tinged with tawny; veins tawny; vein Sc not evanescent but meeting costa; R_4 strongly curved forward after leaving R_5 . Halteres tawny.

Legs tawny, darker at apex of tarsi, not strongly bristled but bristles more distinct at apices of joints; anterior protarsi somewhat thickened; pulvilli tawny; claws black on distal half but tawny on basal half, owing to tawny pubescence.

Abdomen rich brownish-yellow, but tawny across posterior margin of each segment and at sides; clothed with long delicate tawny hairs, which become bristle-like on apical segment and laterally on posterior margin of each segment. Along sides of abdomen are clear pit-like spots. Genital appendage almost as long as body, tawny in colour but fuscous along lower edge.

♂. Length, 6 mm.; + genital appendage, 11 mm.

Holotype: 1208, D. M.

Habitat.—George's Stream, Wainuiomata (G. V. Hudson).

H. littoralis n. sp.

♂. Eyes dichoptic, emarginate at antennae; front brownish-black, with cinereous reflections and a row of delicate bristles on each side; ocellar triangle brownish-black, with pair of strong ocellar bristles. Face short and cinereous. Antennae (fig. 44) large, black with silvery reflection, third joint clavate with short style. Proboscis a little longer than head-height, directed downwards, blackish-brown; palpi short and black, but brownish basally. Occiput cinereous and bristly (fig. 45).

Thorax blackish-brown in ground-colour, pleurae cinereous to silvery; pteropleurae with transverse row of delicate grey bristles; dorsum (when viewed with light falling from in front) narrowly margined on each side with blackish-brown; adjoining this margin is a silvery area and centrally a large reddish-brown area with a pair of indistinct darker stripes more conspicuous anteriorly behind head, where the reddish-brown merges into a cinereous reflection (fig. 46); the whole surface distinctly bristly, among which is a system of chaetae as in fig. 46. Metanotum cinereous.

Wings not coloured, veins tawny; Sc ending in costa; anal angle prominent. Halteres brown.

Legs brown, tarsi black; bristly; anterior protarsi somewhat enlarged.

Abdomen bristly; black with cinereous reflections. Genitalia more or less almond-shaped when viewed from above; in profile (fig. 47) lying forward over dorsal surface of apical abdominal segments.

♂. Length, 3.75 mm.

Holotype: No. 1165, D. M.

Habitat.—Occurring in large numbers on sandy sea-beach at the mouth of the sluggish Hokio Stream.

H. vector n. sp.

♂. Eyes as in *H. flavinceris*; ocellar triangle black with brownish-grey tomentum; the pair of ocellar bristles easily distinguished from the smaller posterior series; ocelli amber-yellow; front black with grey tomentum and row of delicate bristles along orbits. First and second

FIGS. 38-41.—*Brachystoma hamiltoni* n. sp.

- 38. Antenna.
- 39. Dorsum of thorax, showing chaetotaxy.
- 40. Wing.
- 41. Genitalia, ♂.

FIGS. 42, 43.—*Hilara flavinceris* n. sp.

- 42. Occiput, ♂, showing chaetotaxy.
- 43. Dorsum of thorax, showing chaetotaxy.

FIGS. 44-47.—*Hilara littoralis* n. sp.

- 44. Antenna.
- 45. Occiput, ♂, showing chaetotaxy.
- 46. Dorsum of thorax, showing colour-pattern and chaetotaxy.
- 47. Genitalia, ♂.

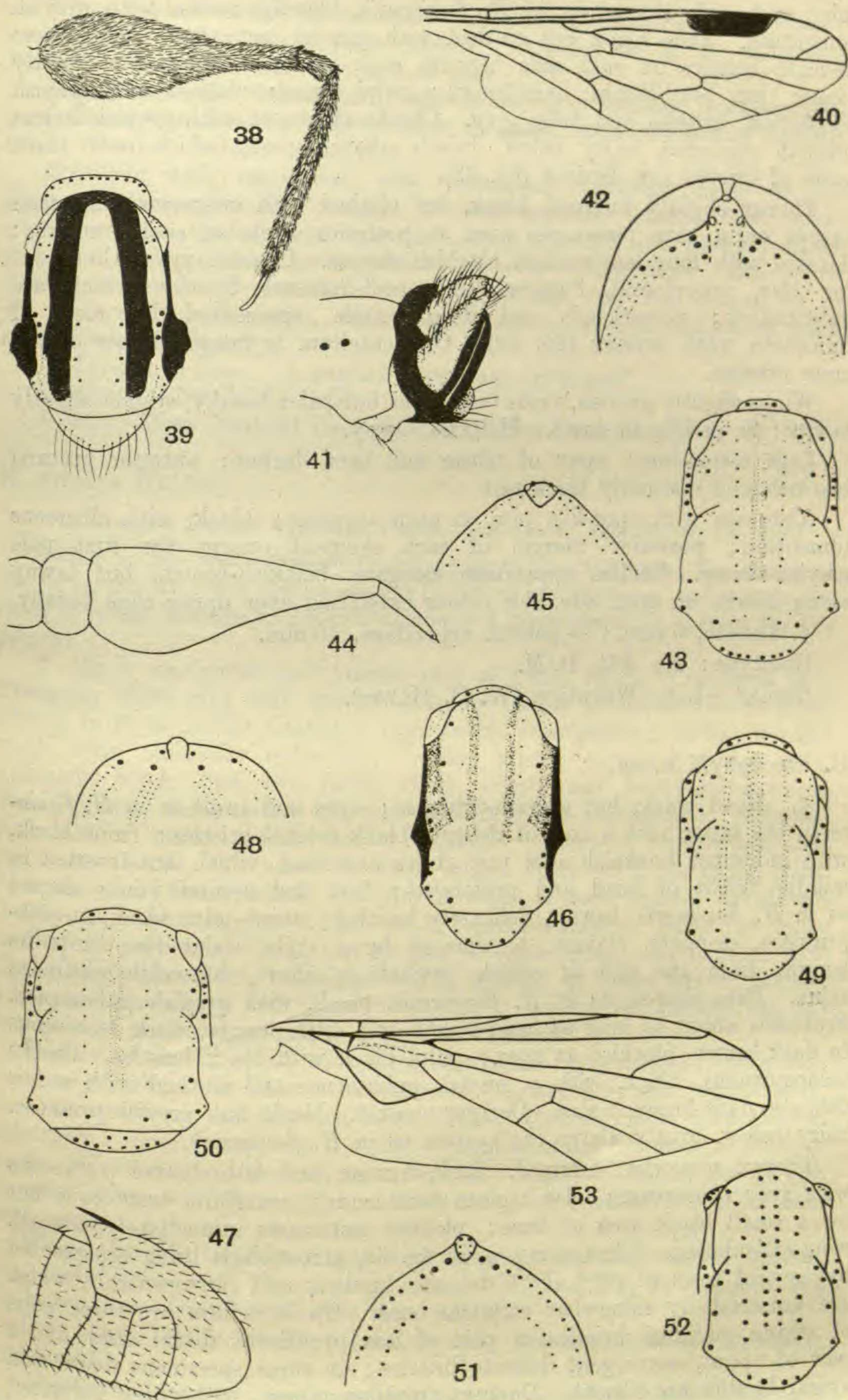
FIGS. 48, 49.—*Hilara vector* n. sp.

- 48. Occiput, ♂, showing chaetotaxy.
- 49. Dorsum of thorax, ♂, showing chaetotaxy.

FIG. 50.—*Hilaria dracophylli* n. sp.: dorsum of thorax, ♂, showing chaetotaxy.

FIGS. 51-53.—*Hilara fumosa*.

- 51. Occiput, ♂, showing chaetotaxy.
- 52. Dorsum of thorax, ♂, showing chaetotaxy.
- 53. Wing.



joints of antennae black but covered with grey tomentum, bristly; third joint and style shaped as in *H. flavinceris*, blackish-brown with greyish tomentum. Face black but clothed with greyish tomentum, three short delicate bristles on each side beneath each antenna. Proboscis slightly longer than head-height, dark-brown; palpi densely clothed with greyish tomentum, bristles and hairs grey. Cheeks cinereous with greyish hairs; occiput cinereous, hairy below, bristly above, among which only three pairs of bristles are distinct (fig. 48).

Thorax slightly humped, black, but clothed with cinereous tomentum except on a bare testaceous area at posterior angle of each humerus; dorsum with four longitudinal blackish stripes. Chaetotaxy weak except for alar, notopleural, humeral, and post-humeral bristles, which are outstanding; acrostichals and dorsocentrals represented by rows of numerous weak bristles (fig. 49). On scutellum is marginal row of ten erect bristles.

Wings slightly greyish, veins testaceous but paler basally, stigma slightly tawny; Sc ending in costa. Halteres tawny.

Legs testaceous; apex of tibiae and tarsi darker; anterior protarsi blackish and distinctly thickened.

Abdomen with spot-like pits on each segment; black, with cinereous tomentum; posterior margin of each segment except the first pale greyish-tawny. Genital appendage elongate, blackish-brown, but tawny along middle on each side, this colour extending over upper edge basally.

♂. Length, 6 mm.; + genital appendage, 10 mm.

Holotype: No. 954, D. M.

Habitat.—Lake Wakatipu (W. G. Howes).

H. dracophylli n. sp.

♂. Head black, but greyish-pruinose; eyes and front as in *H. flavinceris*, the latter with a row of delicate black orbital bristles; front black, with indistinct brownish area just above antennae, which are inserted in middle height of head and prominent; first and second joints shaped as in *H. flavinceris*, tawny, delicately bristled; third joint black, greyish-pruinose, elongate, clavate, terminated by a style about two-thirds its length, from the end of which projects a short, brownish chitinous spine. Face shaped as in *H. flavinceris*, black, with greyish pubescence. Proboscis about as long as head-height or a little longer, dark testaceous to dark brown, blackish at apex; palpi black with black bristles. Cheeks inconspicuous, black, with a greyish pubescence and clothed with a few delicate dark-brown hairs. Occiput convex, black but greyish-pruinose, hairy below, bristly above the system as in *H. flavinceris*.

Thorax somewhat humped, black, humeri and notopleurae testaceous with grey tomentum; alar regions testaceous; scutellum testaceous but for a small black area at base; pleurae testaceous immediately beneath wing-articulation. Chaetotaxy as in fig. 50, acrostichals being represented by several rows of very short delicate bristles, and dorsocentrals, which are uniserial, by somewhat stronger ones. On scutellum are three pairs of strong marginal bristles, a pair of less prominent discal ones, and a pair of apical, convergent delicate bristles; in some specimens discal and apical bristles are absent. Dorsum greyish-pruinose with three indistinct longitudinal black stripes seen in some lights.

Wings hyaline except for testaceous articulation and brownish cell 2nd C and stigma; veins brown, paler basally; venation as in *H. flavinceris*. Halteres pale yellow but brownish at base.

Legs testaceous, clothed with delicate hair-like bristles; anterior pro-tarsi slightly thickened; claws rather elongate, dark testaceous basally, black distally; pulvilli testaceous.

Abdomen dark testaceous, with testaceous markings, more or less distinct, across posterior margin of each segment except first, upon which is a triangular testaceous spot along anterior and another along posterior margin, their apices meeting in centre of segment. The whole clothed as in *H. flavinceris*. Genital appendage (fig. 2A) shaped as in *H. flavinceris*, dark-brown, with narrow tawny median stripe on each side broadening basally.

♂. Length, 6 mm.; + genital appendage, 10.5 mm.

Holotype: No. 1207, D. M.

Habitat.—New Zealand (locality and collector unknown).

H. fumosa Hutton.

Clinocera fumosa Hutton, *Trans. N.Z. Inst.*, vol. 33, p. 31, 1901.

Owing to the well-developed anal angle of the wing and the shape of the antennae, &c., this species cannot be placed in *Clinocera*, and it is doubtful if it really belongs to *Hilara*, although I have placed it therein for the present.

♂. Eyes contiguous over greater part of front, which is confined to a triangular black area with greyish reflection above antennae and to small area in front of ocellar triangle; eyes deeply emarginate; ocellar triangle black, with cinereous reflection; ocellar bristles strong but not long. Antennae black, first two joints short, bristly and yellowish-brown in some lights; third joint clavate, with greyish pubescence; terminal style slender, rather reddish brown, minutely pubescent, two-jointed, first joint very small, the whole a little longer than third antennal joint. Face short but broad, black, but greyish-white in some lights. Proboscis shorter than head-height, rather stout, blackish-brown; palpi not quite as long as proboscis, black, but greyish in some lights, and clothed with black bristle-like hairs. Occiput black, greyish in some lights, convex below, but flat above and concave medianly; among the bristles (fig. 51) is a pair of outstanding rather divergent verticals.

Dorsum of thorax black, with three longitudinal grey stripes; prothorax, incisions of transverse suture, notopleurae, humeri, and alar regions grey, this pattern being indistinct in some lights; pleurae black, with greyish reflections; metapleurae bare; a tuft of bristles above insertion of anterior coxae. Chaetotaxy of dorsum as in fig. 52. Scutellum black, but greyish in some lights, with three pairs of erect marginal bristles, pre-apical ones being weak.

Wings (fig. 53) slightly tinged with brown, veins and stigma brown; anal angle prominent; Sc meeting costa; Cu_1 and Cu_2 in one line, cell Cu being thus somewhat shorter than cell M.

Legs black, bristly, slender; tarsi normal; anterior coxae not unusually lengthened.

Abdomen elongate, narrow, cylindrical, cinereous but black in ground-colour, distinctly bristly, bristles for the most part hair-like but marginal ones stronger and larger. Genitalia inconspicuous.

♀. Eyes broadly dichoptic, head rather flat on top; front rather convex, blackish-grey; face rectangular and cinereous; proboscis shiny black, stout, curved backwards, just under twice length of head-height; a distinct pair of long, divergent ocellar bristles. Legs more or less tawny; tarsi and upper sides and middle of femora fuscous; coxae, except apex of anterior pair, cinereous-black.

♂ and ♀. Length, 6 mm.

Holotype: ♂, Hutton's collection, Canterbury Museum; ♀, No. 1212, D. M.

Habitat.—Wellington (G. V. Hudson); Otira (J. W. Campbell).

H. hudsoni Hutton.

Empis hudsoni Hutton, *Trans. N.Z. Inst.*, vol. 33, p. 30, 1901.

♂. Eyes dichoptic, deeply emarginate; occiput, front, and face black, but with cinereous tomentum brownish in some lights; fronto-orbital and ocellar bristles present. Antennae shaped as in *H. fossalis*; black, but first and second joints brownish. Proboscis a little longer than head-height, black; palpi brown. Occiput bristly, bristles arranged irregularly on each side of centre, which is bare.

Dorsum of thorax black, with a pair of indistinct brownish stripes; silvery spot on each side between humeri and wings; humeri silvery above; scutellum and alar regions along sides of dorsum to sutural incisions brownish; pleurae cinereous; metanotum brownish. Acrostichal bristles represented by four rows of short, weak bristles; dorsocentrals also weak and short but ending in two pairs of stronger bristles before the scutellum; a strong humeral bristle and numerous small ones; a pair of strong notopleurals, anterior to which are some weak ones; a strong supra-alar, posterior to which is a second one and two weak short ones; a strong post-alar; metapleurae bare; scutellar bristles consisting of four pairs, apical pair weak, pre-apical strong, remainder somewhat weaker.

Wings clear, stigma clouded; halteres brown.

FIGS. 54-56.—*Hilara fossalis* n. sp.

- 54. Occiput, ♂, showing chaetotaxy.
- 55. Dorsum of thorax, showing chaetotaxy.
- 56. Genitalia, ♂.

FIG. 57.—*Hilara smithii* n. sp.: dorsum, ♀, showing chaetotaxy.

FIGS. 58-62.—*Hilarempis fulvipes*.

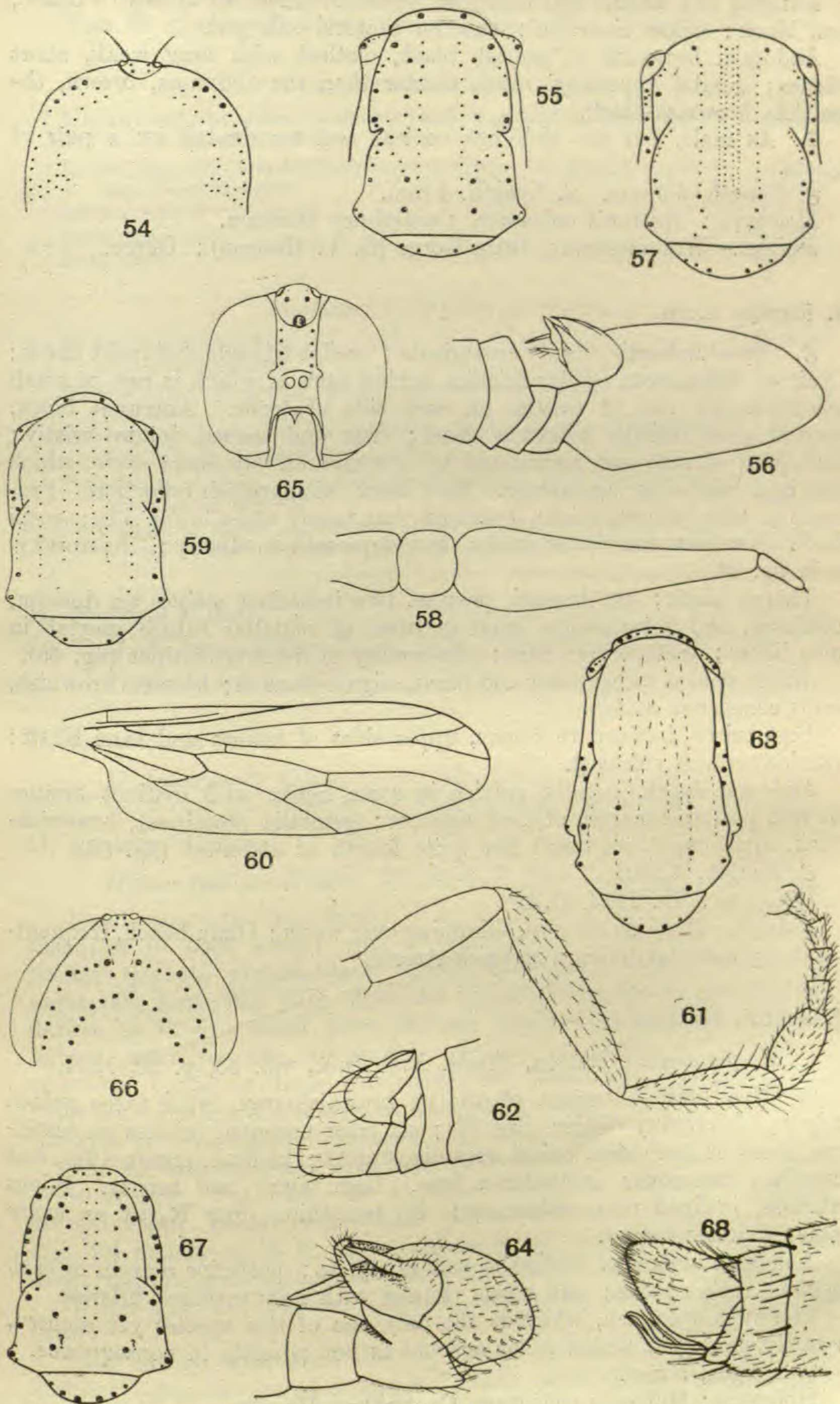
- 58. Antenna.
- 59. Dorsum of thorax, showing chaetotaxy.
- 60. Wing.
- 61. Anterior leg, ♂.
- 62. Genitalia, ♂.

FIGS. 63-64.—*Hilarempis nigra* n. sp.

- 63. Dorsum of thorax, ♂, showing chaetotaxy.
- 64. Genitalia, ♂.

FIGS. 65-68.—*Empimorpha torrentalis* n. sp., ♂.

- 65. Head, front view.
- 66. Occiput of head, showing chaetotaxy.
- 67. Dorsum of thorax, showing chaetotaxy.
- 68. Genitalia.



Anterior and middle legs brownish, posterior cinereous brown to black; tarsi black; coxae cinereous; anterior protarsi enlarged.

Abdomen brownish to greyish black, clothed with very weak, short bristles; genital appendage much shorter than the abdomen, brown, the genitalia brownish-black.

♀. As male, but the abdomen conical and terminated by a pair of stylets.

♂. Length, 5.5 mm. ♀. Length, 4 mm.

Holotype: Hutton's collection, Canterbury Museum.

Habitat.—Wainuiomata; Otira Gorge (G. V. Hudson); Okere.

H. fossalis n. sp.

♂. Eyes dichoptic, deeply emarginate; ocellar triangle and front black; a pair of conspicuous ocellar bristles, behind each of which is row of small delicate ones; row of bristles on each side of front. Antennae black, inserted about middle height of head; first and second joints bristly; third joint clavate and terminated by a comparatively short style, which ends in a bristle-like appendage. Face black, with greyish reflection. Proboscis as long as head-height, brownish, but tawny along lower side; palpi black. Occiput convex at orbits, but depressed medianly; chaetotaxy, as in fig. 54.

Thorax black; the humeri, pleurae, two indistinct stripes on dorsum, scutellum, and a transverse band in front of scutellar suture greyish in some lights; metapleurae bare; chaetotaxy of dorsum distinct (fig. 55).

Wings smoky, rather short and blunt, stigma clouded; halteres brownish, heads somewhat darker.

Legs bristly inclined to tawny, upper sides of femora and tarsi black; anterior protarsi enlarged.

Abdomen black, slightly greyish in some lights, with distinct bristles towards posterior margin of each segment; genitalia prominent, brownish-black, appendage broad and not quite length of abdomen (fig. 56).

♂. Length, 4 mm.

Holotype: No. 1199, D. M.

Habitat.—Makerua Swamp, skimming over water; Ohau beach, frequenting damp sand bordering a sluggish stream.

H. smithii Hutton.

Empis smithii Hutton, *Trans. N.Z. Inst.*, vol. 33, p. 30, 1901.

♀. Head lost. Dorsum of thorax brownish-grey, with three golden stripes; chaetotaxy distinct (fig. 57); six erect marginal bristles on scutellum, three on each side, apical ones convergent; pleurae, metanotum, and scutellum cinereous; metapleurae bare. Legs tawny and bristly. Wings ochreous, inclined to translucency; R_4 branching from R_5 at an acute angle; halteres tawny.

Abdomen cinereous, ending in pair of stylets; posterior margin of each segment rather paler; the whole clothed with minute black bristles.

The type specimen, which is the only one of this species yet secured, is badly damaged, and a fuller account is not possible in consequence.

♀. Length, 5 mm.

Holotype: Hutton's collection, Canterbury Museum.

Habitat.—Ashburton (Smith).

Genus HILAREMPIS Bezzi.

Vein Sc evanescent before reaching the costa; metapleurae bare.

TABLE OF SPECIES.

1	{ A tawny-bodied species; abdomen black, with a tawny apex ..	<i>kaiteriensis.</i>
	{ Cinereous or blackish species	2
2	{ Thorax grey with four blackish-brown stripes; abdomen dark brown; legs brownish-black	<i>benhami.</i>
	{ Species with tawny legs	3
3	{ Body cinereous	<i>fulvipes.</i>
	{ Body black	<i>nigra</i> n. sp.

Provisional Table based on Chaetotaxy.

1	{ At least eight scutellars	<i>benhami.</i>
	{ At most four scutellars	2
2	{ Dorsocentrals altogether weak; one pair of strong prothoracics (fig. 59)	<i>fulvipes.</i>
	{ Dorsocentrals ending in two or three strong bristles before scutellum; two or more pairs of prothoracics	3
3	{ Three pairs of strong dorsocentrals posteriorly; two pairs of strong prothoracics (fig. 63)	<i>nigra</i> n. sp.
	{ Two pairs of strong dorsocentrals posteriorly; four pairs of prothoracics, the outer one on each side strong, the remainder weak	<i>kaiteriensis.</i>

H. benhami Miller.

H. benhami Miller, *Trans. N.Z. Inst.*, vol. 45, p. 198, figs. 1 to 5, pl. 1, fig. 3, 1913.

H. kaiteriensis Miller.

H. kaiteriensis Miller, *l.c.*, p. 200, figs. 6 to 8, pl., fig. 1.

H. fulvipes Hutton.

Hilara fulvipes Hutton, *Trans. N.Z. Inst.*, vol. 33, p. 31, 1901.

Front cinereous, but darker in some lights; eyes deeply emarginate, dichoptic in both sexes; row of delicate frontal bristles on each side; ocellar triangle greyish-black, ocellar bristles present. Antennae comparatively large (fig. 58); first and second joints bristly and tawny, but darker at times; third joint clavate, blackish-brown, with a somewhat lighter reflection due to greyish pubescence; style very short. Face cinereous, owing to dense tomentum, but black ground-colour frequently reflected. Proboscis blackish-brown; palpi tawny. Occiput cinereous, but blackish in some lights; chaetotaxy as in *H. nigra*.

Thorax with depressed area before scutellum (which is rather truncated), brownish-grey, but cinereous at times owing to tomentum; the black ground-colour being conspicuous particularly on pleurae. Chaetotaxy (fig. 59) mainly as in *H. nigra*, although the rows of smaller bristles are distinct, while among them are some delicate golden hairs.

Wings (fig. 60) faintly yellowish, veins and stigma tawny; halteres tawny.

Legs tawny, with some delicate tawny bristles; tarsi rather fuscous; anterior coxae somewhat lengthened, their tibiae short; anterior protarsi of the male swollen (fig. 61).

Abdomen black in ground-colour with cinereous tomentum; posterior margin of each segment with delicate bristles. Genitalia of male lying forward on abdomen (fig. 62); female abdomen ending in pair of blackish-brown stylets.

♂ ♀. Length, 3 mm.

Plesiotype: No. 1087, D. M.

Habitat.—Throughout New Zealand. Frequently seen on calm evenings dancing in swarms above bushes.

H. nigra n. sp.

♂. Eyes dichoptic, deeply emarginate, posterior margin slightly concave; front moderately wide, sides almost parallel, black, but in certain lights there is a broad silvery-grey orbital stripe on each side, leaving a narrow black medio-longitudinal one; at other times the whole front is silvery grey; a row of delicate frontal bristles on each side near orbits; ocellar triangle black; ocellar bristles distinct. Antennae large for size of head, inserted at about middle line; black, with greyish-brown reflection; minutely pubescent; first and second joints bristly, third long and clavate; style short and ending in small spine-like process. Face short, shorter than front, convex, with a few scattered delicate bristles. Proboscis blackish-brown; apical joint of palpi orange yellow to pale yellow, basal blackish-brown. Occiput black, with greyish reflection, convex (particularly above where the bristles are distinct along the orbits alone), though somewhat depressed behind ocellar triangle; chaetotaxy confined to row of orbital bristles.

Thorax black, with greyish and brownish reflections on dorsum and pleurae; a pair of very indistinct, widely separated, narrow, darker stripes on dorsum to be seen when light falls from in front. On dorsum are a few rows of indistinct delicate small bristles and a system of distinct ones (fig. 63).

Wings iridescent, veins yellow, Sc evanescent before reaching costa; anal angle distinct but not prominent; halteres pale tawny.

Legs tawny, tarsi and apices of tibiae fuscous; a row of conspicuous yellow bristles on upper side of anterior femora distally; otherwise legs not unusually bristly; anterior protarsi and apex of their tibiae only slightly enlarged.

Abdomen black, covered with short delicate bristles; genitalia black, prominent, recurved over abdomen, laterally compressed (fig. 64).

♂. Length, 3 mm.

Holotype: No. 1224, D. M.

Habitat.—Otira (J. W. Campbell), Ohau Valley; frequenting the foliage of bushes overhanging streams. Usually met with while beating.

Genus EMPIS Linn.

Metapleurae with hairs or bristles; proboscis as long as or longer than head-height; third antennal joint more or less elongate and clavate; face bare; vein Sc evanescent before reaching costa.

TABLE OF SPECIES.

An altogether cinereous species; length of ♀, 5.5 mm.	..	..	♀ <i>brouni</i> .
A blackish-grey species; length of ♀, 8 mm.	..	..	♀ <i>otakauensis</i> .

E. otakauensis Miller.

E. otakauensis Miller, *Trans. N.Z. Inst.*, vol. 42, p. 235, pl. 30, figs. 1 to 6, 1909.

In this species the palpi are normal, and not greatly elongated as stated in the original description and shown in the illustration (*l.c.*, fig. 2).

Holotype, ♂: No. 590, D. M.

Allotype, ♀: No. 404, D. M.

E. brouni Hutton.

E. brouni Hutton, *Trans. N.Z. Inst.*, vol. 33, p. 30, 1901.

♀. Head cinereous, the face inclined to silvery; front broad orbits converging slightly at antennae; row of delicate orbital bristles on each side of front; distinct pair of ocellar bristles and shorter pair between posterior ocelli. Antennae at middle head-height; cinereous; first and second joints blackish in some lights and bristly; third joint clavate and ending in a stout style not quite half length of third joint. Face short, but broader than front, silvery in some lights. Cheeks and lower part of occiput with long beard of greyish to golden hairs. Proboscis longer than head-height, blackish-brown and cinereous; palpi cinereous to silvery and clothed with greyish hairs. Occiput cinereous to golden, with strong orbital bristles and weaker ones behind.

Thorax cinereous to golden; a pair of blackish stripes on dorsum. Apparently no chaetae except for a pair of bristles on alar angles and a small one above the wing-base; metapleurae with indistinct greyish hairs; propleurae with some delicate greyish hairs. Scutellum with three pair of delicate erect marginal bristles.

Wings comparatively large, rather translucent, tinged with grey; veins rather tawny; R_4 branching almost at right angle from R_5 , which descends somewhat from line of R_{4+5} ; Sc evanescent at apex; halteres tawny.

Legs cinereous and bristly; posterior tibiae broadened apically, their protarsi somewhat enlarged.

Abdomen cinereous; apical segment triangular, blackish and bristly, particularly at apex.

♀. Length, 5.5 mm.

Holotype: Hutton's collection, Canterbury Museum.

Habitat.—Auckland (Broun).

Genus **EMPIMORPHA** Coqu.

This genus resembles *Empis* except that the face is hairy.

E. torrentalis n. sp.

♂. Head tawny; eyes emarginate, dichoptic; front almost vertical, golden in some lights, with row of short black orbital bristles on each side (fig. 65); ocellar triangle large, tawny to golden, a pair of large black erect and divergent ocellar bristles and numerous small ones behind (figs. 65 and 66); ocelli orange. Antennae conspicuous, inserted about middle head-height; first and second joints tawny and bristly; third joint clavate, fuscous,

except for a small tawny area at base, and clothed with minute golden pubescence; style about two-thirds as long as third joint, fuscous but with minute golden pubescence. Face (fig. 65) broad, very short, practically concealed beneath antennae, and with a few short black bristle-like hairs. Cheeks restricted, golden-tawny, and with pair of short black bristle-like hairs. Proboscis longer than head-height, descending downward, tawny; palpi tawny to golden, with long rigid black bristles on lower side but short ones apically. Occiput golden-tawny, swollen at eye-margins, chaetotaxy prominent (fig. 66).

Thorax tawny, golden-pruinose; dorsum quadrate, darker to fuscous in some lights with indistinct narrow longitudinal stripes, chaetotaxy distinct (fig. 67); metanotum brownish-black and golden-pruinose; propleurae with three black bristles and narrow black stripe above toward humeri; metapleurae with three large straight black bristles, the lower one very long; posterior to these bristles are numerous shorter and more delicate ones. Scutellum brownish-black and golden-pruinose, with three pairs of marginal bristles, the apical ones being very long.

Wings slightly tinged with tawny, stigma darker; R_4 leaving R_5 at right angle and running for one-quarter of its length before curving abruptly to costa; halteres tawny.

Legs tawny, minutely bristled and with numerous large black bristles, particularly on tibiae; none on tarsi except at apex of joints; pulvilli golden; claws tawny with fuscous tips.

Abdomen elongate, narrow, slightly tapering apically; brownish-yellow, posterior margin of each segment broadly tawny; the whole clothed with short black bristles and with large ones across posterior margin of each segment, particularly toward sides; a double row of these bristles on first segment. Genitalia (fig. 68) tawny, triangular in shape when seen from above, rather cone-shaped in profile, clothed with small black bristles, particularly at apex; the claspers tawny and elbowed.

♂. Length, 5.5 mm.

Holotype: No. 1213, D. M.

Habitat.—Waterfalls, Humboldt Mountains (G. V. Hudson).